THE UNIVERSITY OF ALBERTA

AN ASSESSMENT OF THE ALTERNATIVE LEVELS OF COOPERATION BETWEEN THE FEDERAL GOVERNMENT OF CANADA AND THE PROVINCIAL GOVERNMENT OF ALBERTA IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

BY

CHRISTOPHER ST. ELMO MICHELL-VIRET

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Date: 10th January, 1989.

DEDICATION

This thesis is dedicated to,
my mother,
Esme.

ABSTRACT

This thesis is an assessment of the current and alternative levels of co-operation that exist and might exist between the Federal Government of Canada and the Provincial Government of Alberta, in the management of Alberta water resources.

This thesis is divided into four sections. These sections are focussed respectively upon the federal role, the provincial role, the federal-provincial programs and an assessment of the effectiveness and alternatives in federal-provincial programs in water resources development in Alberta.

A survey of perceptions, priorities and management practices, conducted with senior managers in the water sector, is used throughout the thesis. This survey is used to identify consistencies and inconsistencies both within and between departments and agencies at the federal and provincial levels of government.

The fundamental principle behind the findings of the thesis involves establishing a flexible framework in federal-provincial agreements at the level of specific issue-oriented agreements.

Such flexibility in a framework or structure could enhance the potential for similar flexibility in traditionally more formal, comprehensive basin planning and implementation agreements.

The primary benefits to be gained from the greater consolidation of water resources management agencies and improved consistency of priorities in implementing these programs; would be a more efficient system of negotiation and increased consistency in the delivery of co-operative federal-provincial water management programs. The consolidation of policy within government agencies, involved in water management,would also provide greater continuity in co-operative water management programs and facilitate greater interaction between federal and provincial agencies.

The striking differences and inconsistencies in water management policies, directives and perspectives within and between departments at the federal and provincial levels of government, is a flaw of the current water management strategies that cannot be overestimated.

Further research into the feasibility of a non-legislating, federal-provincial Water Directorate is required. The sole mandate of such a directorate should be to ensure that the maximum degree of consistency exists in water management priorities, legislation, intra and inter departmentally, at both the provincial and federal levels of government. Apart from the structural, perceptual and political recommendations that have been suggested in the context of federal-provincial agreements, the introduction of such a directorate would appear to enhance the realization of an economically and environmentally balanced approach to the comprehensive management of Alberta water resources.

PREFACE

This thesis is intended to provide an investigative insight into the mechanisms that prevail in controlling the level of federal-provincial cooperation in the management of Alberta water resources. The scope of comprehensive water resources management in Alberta, spans many different departments and ranges through several levels of government.

In order to accommodate the diversity of organizations, legislation and modes of operation that are found in the water management sector; six primary areas of water development are identified as cores around which the levels of federal-provincial cooperation are assessed.

The six primary areas of water development are given as:

(i) Diversification in water resources development.
(ii) Quality of Life resulting from water resources development.
(iii) Balanced Regional Growth resulting from water resources development.
(iv) Resources Development in the water resources sector.
(v) Foreign Markets Development with respect to water resources development.

(vi) International Relations Development with respect to water resources development.

An analysis of the level of federal-provincial cooperation in the management of Alberta water resources, within these six areas of water development, is conducted in the form of a "perceptions study." Senior managers in the private and public water management sectors have been requested to relate the perceived state and conditions found within the water development sector. The responses have generally been in response to a questionnaire, and have provided insight into the diversity, conflict and levels of cooperation within and between the different agencies involved in Alberta water resources development, at the federal and provincial levels of government.

ACKNOWLEDGEMENTS

I would like to take this opportunity to express my gratitude to Dr. Arleigh Laycock for guidance and encouragement during the research and compilation of this thesis.

A very special thanks is extended to Mrs. Sheila Young, whose perseverance and great spirits carried me through the endless drafts and revisions.

My sincere thanks to you both.

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1.0 INTRODUCTION

This thesis study is intended to provide an investigative insight into the mechanisms that prevail in controlling the level of federal-provincial cooperation in the management of Alberta water resources. The conceptual structure of the thesis may be divided into four separate sections that relate to the comprehensive management of the province's water resources. These four sections may be defined as:

(i) The role of the Federal Government
(ii) The role of the Provincial Government
(iii) The application of Federal-Provincial Programs
(iv) The effective role of Federal-Provincial Programs within the management of Alberta water resources.

A similar structure has been adopted for the analysis of the first three sections. The structure of the analysis revolves about six key issues. These issues are as follows:

(i) Diversification in Water Management

(ii) Quality of Life
(iii) Balanced Regional Growth
(iv) Resources Development
(v) Foreign Market Development
(vi) International Relations Development

The impact of these six issues is assessed, firstly, within the context of the Federal Government role in the management of Alberta water resources. The only deviation from the general structure of this analysis is the use of selected pieces of Federal Government legislation that serve as an indicator of the primary trends in the development of federal water management policy. The rationale for this development is that the degree of Provincial Government involvement in federal legislation is an indirect indicator of the long-term level of federal-provincial cooperation, at the time that the legislation was drafted. The tendency for gradually increasing provincial government involvement in Federal Government legislation has had a profound impact upon the management of Alberta water resources.

In the analysis of the Provincial Government's role in the management of Alberta water resources; the only deviation from the general structure of the analysis involves an assessment of ten water-related development issues. The ten issues may be defined as:

(i) Community Development
(ii) Industrial Development
(iii) Agricultural Development
(iv) Irrigation Development
(v) Energy Development
(vi) Tourism Development
(vii) Recreation Development
(viii) Fish Management Development
(ix) Wildlife Management Development
(x) Environmental and Historical Resource Development

These analyses of Federal and Provincial Government roles in the management of Alberta water resources are employed in an assessment of the application of federal-provincial programs in the province.

The final section in the conceptual structure of this thesis involves an assessment of the effective role of federal-provincial programs within the management of Alberta water resources. Within this section, reviews are conducted of federal-provincial program participation and federal-provincial program structures. Following the reviews, an assessment is conducted of federal-provincial program effectiveness in the management of Alberta water resources. In conclusion, the recommendations and probable ramifications that could result from such initiatives are assessed with respect to proposed improvements in the design and delivery of federal-provincial programs in water management, within Alberta.

Throughout the thesis, the perspectives of senior managers in the water management sector, on the state of policies and programs relating to water resources, are used extensively. These perspectives have been gathered from a survey that was conducted of senior managers in water resources management in both the private and public sectors. The perspectives have served to indicate the degree and effectiveness with which policies and programs have been implemented. Furthermore, these perspectives on the water resources sector have eased the identification of consistencies and inconsistencies within and between the provincial and federal levels of government in the management of Alberta water resources.The analysis of issues in this thesis reflect the conditions of water resources management into the first quarter of 1988.

2.0 THE ROLE OF THE FEDERAL GOVERNMENT IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

> "Water is, at present, Canada's most undervalued and neglected natural resource. In no part of Canada is freshwater of sufficient quality and quantity that it can continue to be overused and abused in the way it has been in recent decades. The underlying philosphy of the Federal Water Policy is that Canadians must start viewing both water as a key to environmental health and as a scarce commodity having real value that must be managed accordingly."

[1]

2.1 GENERAL HISTORICAL OVERVIEW

The historical role of the Federal Government has been shaped by several turning points, marked by pieces of legislation implemented in the early history of the nation. The Fisheries Act preceded the BNA Act by 10 years and was administered by the Department of Marine and Fisheries. This Act was concerned primarily with the issuing and enforcement of fish licences and the operation fish replenishment programs. Notably the British North America Act of 1867, did not specifically mention water, but did allocate exclusive legislative jurisdiction over fisheries and navigation to the Federal Government, with agriculture as a joint federal-provincial domain.

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[1] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Page 3.

Under federal jurisdiction, the Department of Public Works was made responsible for canals, lighthouses and harbours. Administration of waterways remained under the Department of Marine and Fisheries.
The Dominion Land Act of 1872 was the result of land surveys commissioned by the Dominion of Canada to assess the potential for homesteads on the prairies. By 1894, the lobbying of the prairie farmers had aided in successfully steering the Northwest Irrigation Act through parliament with the aid of a positive needs assessment for the use of irrigation conducted by the Department of the Interior. This legislation introduced the principle of prior appropriation into Canadian water law and thereby enhanced the potential for the orderly development of western rivers. The ownership of water resources was vested in the Crown. Use of water resources thus became subject to government licence. Improved farming practices as a result of irrigation enhanced the potential for further regional settling and the development of the prairie.

[2]

Water quality concerns had emerged as an issue by 1904 and prompted the Department of Interior to conduct surveys on river flow and the depths of lakes and harbours. These studies continued until 1936, at which time responsibility was transferred to the Department of Mines and Resources. This department also assumed the responsibility for the monitoring of water quality.

A commission on conservation was undertaken from 1909 until 1920 as Conservationists in 1909 were primarily concerned with hydroelectricity and the protection of municipal water supplies. In the wake of the Canadian Forestry Convention of 1909, the International Boundary Waters Treaty was passed. In this treaty, Great Britain and the United States of America established the International Joint Commission. The Commission was provided with guidelines to approve works and uses in the Great Lakes-St. Lawrence System and to prohibit transboundary pollution that would result in injury to health or property.

[3]

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[2] P. Cossage, Water in Canadian History. Montreal: University of Quebec. 1985.

[3] D.G. LeMarquand, Boundary Water Relations and the Great Lake Issues. Inquiry on Federal Water

By 1930, the provinces had successfully lobbied the Dominion government for control of their natural resources with the passage of the Natural Resource Transfer Agreement. Despite this legislation the Federal Government assumed much of the provincial indebtedness incurred during the 1930's. In 1935, the Prairie Farm Rehabilitation Act was established to undertake programs in the drought and soil drifting areas of the prairie provinces.

During the post world war II period, ongoing commitments to resource development were more broadly stated. With the establishment of the Eastern Rockies Forest Conservation Board in 1947, joint federal-provincial programs were established for the purposes of forest watershed management. The joint program was for five years, followed by a twenty year provincial program. In 1948, the Prairie Provinces Water Board was formed to allocate the use of interprovincial water. An agreement was concluded on the allocation of interprovincial water use in 1969-70.

During the late 1960's water resource management increased in profile. In 1966, the Water Resources Branch was transferred from the Department of Northern Affairs and National Resources to the Department of Energy, Mines and Resources. As part of this reorganization, water resource management was later

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Policy Research Papers. Ottawa: Government of Canada. 1985.

accorded the status of a department (Environment Canada), in 1970. Amendments to the Fisheries Act and Canada Shipping Act were enacted along with the Canada Water Act, Northern Inlands Waters Act and Arctic Waters Pollution Prevention Act of 1970. During this year the Department of Environment was established under the Government Reorganizaton Act to coordinate environmental quality management. With the creation of the departments of Environment, Energy and Natural Resources, Environmental Protection Service and the Inland Waters Directorate; water resources management was conducted at the level of a directorate.

The Flood Damage Reduction Program was approved by Cabinet in 1975, to discourage new investment in the flood-prone areas. All provinces except Prince Edward Island, British Columbia, Alberta and the Yukon currently fully participate in this program. During the same year, the Environmental Contaminants Act was passed to restrict the manufacture and distribution of harmful chemicals. The drinking water standards of 1968 were also revised and reflect the perceived need for greater control over drinking water quality.

The creation of the separate Department of Fisheries and Oceans, in 1977, somewhat undermined the general mandate of the Department of Environment for comprehensive environmental quality management. The Department of Environment did, however, maintain jurisdiction over

Section 33 of the Fisheries Act which legislates water pollution control.

Additional legislation in place in 1982 provided a national network of stations on a cost sharing basis for water quality monitoring,and the enforcement of revised water quality standards.

Introduction of the Canadian Heritage Rivers System in 1983 has enabled provinces and territories to nominate specific waterways for protection. This legislation recognizes the socio-cultural value of the Canadian river system as well as the traditional economic and environmental values.

2.1.1 CURRENT INITIATIVES IN FEDERAL GOVERNMENT WATER MANAGEMENT STRATEGIES

In 1984, research was initiated on an Inquiry into the Federal Government's role in water management. The Commission reported on their findings in September,1985. The Pearse Commission identified that throughout,"water-related projects have long been used to secure Canadian nation-building objectives, which include; facilitating commerce, resisting American incursions and populating the west. The nation's activities have always focused around fisheries, agriculture and navigation and the limited perception of local, regional or national water budgets, with withdrawal and consumption and the possibility of deteriorating water resources."

[4]

Today, the agencies of the federal government continue to assess the national water resource potential in terms of:

(i) Mean annual precipitation
(ii) Mean annual runoff
(iii) Large lakes
(iv) Groundwater aquifer potential
(v) Dams
(vi) Water transfer requirements

The results of ongoing assessments of the national water resources potential are expected to provide information for the further refinements to the Hydrological Atlas of Canada (Fisheries and Environment Canada (1978)). Accurate assessments of Canada's national water budget will highlight the regional differences in water use patterns across Canada.

The quality requirements for municipal water use and the increasing demand for waterworks and improved sewage treatment, has necessitated a growing involvement by the federal government in the costly sector of municipal water supply and treatment.

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[4] P.H. Pearse, F. Bertrand and J.W. McLaren. Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. 1985. Page 18.

Similarly, irrigation practices in agriculture represent one of the greatest single consumptive uses of water in Canada and has intensified the problems of soil salinization and erosion. Federal government participation in addressing these concerns was particularly applicable to the Province of Alberta. Both mining and manufacturing have the potential for degrading water with added suspended solids, heavy metals, acids and industrial pollutants. The role of the federal government in policing these industries is determined by the conflicts and infractions of standards which have been identified with regard to the use of water and the resulting state of the resource. Thermal electricity generation has prompted federal government involvement somewhat indirectly through heightened concern over the effects of acid rain associated with oil and coal fired generators.

As a result of these demands upon water use, the role of the federal government becomes increasingly important to project the future withdrawal and consumptive uses of water in Canada's future. The instream uses of navigation, waste disposal, fish, wildlife and recreation add a further component in the competition for use of Canadian water resources. In an attempt to index the variety amongst the demands for water uses, the federal government has historically used estimates of the economic value of water used in each sector of water use.

The absolute economic value of water in certain sectors of the water supply and demand economy are placed under significant pressure by the variations in water quality which result across the nation. The primary contributors to this degradation in water quality are:

(i) Petroleum & Refinery Industries
(ii) Phosphorus & Chloro Alkali Manufacturing
(iii) Pulp and Paper Industry discharge
(iv) Atmospheric, Radioactive and Thermal Pollution
(v) Agriculture
(vi) Stormwater
(vii) Groundwater
(viii) Coastal Pollution

5

Sectors (v - viii) represent non-point sources throughout the nation and are therefore particularly difficult to quantify.

Collectively, the historical role of the Canadian

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5 P.H. Pearse, F. Bertrand, J.W. McLaren. Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. 1985. Pages 55-61.

government, in combination with the recent strategies, current programs, initiatives and ongoing issues in Canadian resource management has resulted in a series of programs spread throughout many departments and often based on federal provincial cooperation for cost sharing purposes.

The primary focus of federal programs currently in place involves:

(i) the provision of guidelines for drinking water quality

(ii) the planning and provision of navigational and port facilities

(iii) federal involvement in irrigation and farm water supply systems with support programs for rural soil and water conservation

(iv) federal involvement in flood control to address the mitigation of human suffering and loss due to flooding

(v) federal government involvement in international and interprovincial water use and management strategies in both water quality and quantity control.

Research programs currently being undertaken by the federal government include further study into:

(i) watershed management

(ii) water demand management

(iii) water supply management

(iv) programs in municipalities and agriculture

(v) flood control programs

(vi) ramifications of domestic and industrial water use

(vii) toxic and persistant contaminants

(viii) the effects of atmospheric pollution

As perceived by the Inland Waters Directorate, this role in water resource management is to ensure that the waters of the nation are protected and used for the greatest social and economic benefit of Canadians, including both the present and future generations. In Canada the federal government does not have a strong mandate for the management of resources. It does, however, have clearly defined responsibilities and concerns with respect to how the management of resources at the provincial level will reflect upon the national interests. Most of the activities carried out by the Inland Water Directorate, Western and Northern Regions are conducted in close cooperation with the provinces or territories, often under federal-provincial cost sharing agreements.

Today the department of Environment Canada is essentially the lead agency in the Federal Government in establishing the general priority, objectives and policies in federal water management. The department is responsible for environmental water quality and water quantity programs, as well as the administration of the Canada Water Act, International Rivers Improvement Act, the Migratory Bird Convention Act and section 33 of the Fisheries Act. The Environmental Contaminants Act is administered jointly by the Department of Environment Canada and National Health and Welfare.

Environment Canada is comprised primarily of the Environment Protection Service and the Environment Conservation Service. The Environment Conservation Service is responsible for the administration and enforcement of the Canada Water Act. The administration of water quality and quantity programs are conducted through its Inland Waters Directorate, with the exception of regulatory issues in water quality. Water quality regulation is the responsibility of the Environmental Protection Service and is conducted in conjunction with air and land pollution control. The Environmental Protection Service administers section 33 of the Fisheries Act, the Environmental Contaminants Act and advises the Atomic Energy Control Board on environmental protection aspects of the nuclear industry.

Under the terms of the Federal Water Policy (1987) the Federal Government has recognized that:

> "We must now start viewing water both as a key to

> environmental health and as a commodity that has real value, and begin to manage it accordingly."

In implementing the Federal Water Policy (1987), the Federal Government has adopted;

> "A joint and co-operative management approach with the provinces is sought by the federal government since, under the Constitution Act, the provinces exercise direct control over many aspects of water management. The federal government intends to work with the provinces and territories to encourage the provision of safe and sufficient water supplies for Canadians in areas of federal and shared jurisdiction. The Federal Water Policy demonstrates leadership by its commitment to developing and applying the concept of "a fair value for water." In doing so, the federal government will respect provincial jurisdiction and international obligations, and proceed in a manner that furthers social and political goals and contributes to regional development."

> "The overall objective of the federal water policy is to encourage the use of freshwater in an efficient and equitable manner consistent with the social, economic and environmental needs of present

and future generations.

The purpose of the Federal Water Policy is to set down the goals and actions by which the federal government intends to contribute to this objective through its own and through co-operative programs, the development of information and expertise, technological development and transfer, and promotion of public awareness. But this objective should not be just the government's - water so pervades our lives that all sectors of society and Canadians individually must embrace the fundamental 'value of water' concept."

The federal government has identified two main goals with respect to water:

1. To protect and enhance the quality of the water resources

This goal means anticipating and preventing the contamination of all Canadian waters by harmful substances, and working to encourage the restoration of those waters that are contaminated. It is now realized, however, that more stringent regulations and standards alone cannot protect our water resources without economic incentives (and penalties) to prevent their impairment. This policy has an emphasis upon the promotion of the "polluter pays" principle, which will re-direct the inevitable costs of pollution reduction to those responsible. As a result, costs are distributed more fairly to the benefit of all Canadians and the environment as a whole.

2. To promote the wise and efficient management and use of water

This goal means establishing new ground rules and procedures that respect the value of water to all sectors of society and to the environment. The key innovation is to recognize the value of the resource - both by promoting the realistic pricing of water used, and by respecting the value of recreational water uses and other similar uses where direct charges are not applicable. As a result, governments will be able to reduce their water investments and improve the operating efficiency of water systems through better technology and practices. The private sector and individuals will benefit in direct savings to particular water users, growth of environmental industries, personal health and, ultimately, the peace of mind that comes from knowing that Canada's water will be safe for both present and future generations."[6]

---

[6] Environment Canada. Federal Water Policy
Ottawa: Government of Canada. 1987.
pp 1-5.

Current iniatives are thus focussed upon securing and implementing a viable ,environmentally and economically balanced Federal Water Policy.

2.2 GENERAL PRIORITIES, OBJECTIVES AND POLICIES IN FEDERAL WATER MANAGEMENT STRATEGIES

Under the terms of the Federal Water Policy (1987),

> "the federal government proposes to use five strategies to reach its stated goals, and will be guided in its actions over the near future by the analysis of a selection of water concerns with implications for the federal government. The five strategies are broad courses of action which define a supportive, yet flexible, role for the federal government, one that enables the various federal agencies, other levels of government, and industry, to respond to their particular circumstances and challenges. This approach is compatible with the federal structure and the realities of a large and diverse country."

[7]

In the development of comprehensive management strategies in the water resources sector, six primary areas of development have been adopted. These areas are:

(i) Diversification in Water Management

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[7] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Page iv.

(ii) Quality of Life
(iii) Balanced Regional Growth
(iv) Resources Development
(v) Foreign Markets Development
(vi) International Relations Development

The five strategies proposed in the Federal Water Policy, could be applied in each of these six water development areas and may be given as follows:

Strategy i)	Water Pricing
Strategy ii)	Science Leadership
Strategy iii)	Integrated Planning
Strategy iv)	Legislation
Strategy v)	Public Awareness

In generating a water pricing strategy the federal government has acknowledged that;

> "Despite recognition of the necessity of water for the life and health of people and ecosystems, the resource has generally been taken for granted, undervalued and, consequently, overused and abused. Canada's per capita water-use rates are among the highest in the world and the prices charged for it are among the lowest. In addition, Canadians have tended to undervalue instream uses in their water management decisions, with very expensive long-term consequences.
>
> Until now, Canadians have become accustomed to a

plentiful supply of low priced water through government subsidies and an emphasis on supply-side management. But realization is beginning to dawn that nominal charges have fostered the overuse of water which in turn, has resulted in the need for larger, more costly infrastructure to treat, store and distribute the water, and to treat wastewater. Yet, the billions of dollars required for the development or rehabilitation of water and wastewater systems cannot be met from existing funding mechanisms. Water pricing is, therefore, a solution.

Realistic water pricing would make the users conscious of the real value of the resource and delivery systems, and would reduce the demand on those systems; it would also encourage efficiency through improved technology, and lead to water conservation and reduced pressures for costly system expansion. Pricing of water is exercised mainly by provincial and local governments. The federal government will apply this concept in its own areas of jurisdiction, promote the use of market and market-type forces and beneficiary/polluter pays policies to achieve the most efficient long-range use of water resources, and participate with other levels of government in meeting its responsibility in a manner that

> recognizes the social, economic and environmental value of freshwater resources to Canadians.
>
> The federal government is committed to the concept of "a fair value for water." To implement this concept in federal policies, programs and initiatives, the federal government will:
>
> - endorse the concept of realistic pricing as a direct means of controlling demand and generating revenues to cover costs;
> - develop new water-efficient technologies and industrial processes that minimize cost, and encourage water conservation and improved water quality;
> - undertake, support and promote joint federal-provincial examination of the costs and pricing of water for both consumptive and non-consumptive water uses; and
> - encourage the application of pricing and other strategies, such as the beneficiary/pollutor pays concept, to encourage efficient water use."

The economic value of water, as a commodity and as a critical factor in being able to formulate an environmentally and economically viable Federal Water Policy, has been realized.

The second strategy in the Federal Water Policy involves:

"Scientific and socio-economic research, technological development and data collection are essential tools for dealing with the increasing scope and complexity of the emerging resource problems. Effective management of the water resource, whether through regulation, establishment of guidelines and codes of practice, or through leadership by example, is dependent upon a scientifically sound knowledge base developed in co-operative with all responsible jurisdictions and the private sector.

These co-operative efforts must deal with the need for research in the fields relevant to the understanding of current and future water issues of national and regional significance, and they must ensure that the water data (quantity, quality and use) that describe the health and value of Canada's freshwaters are reliable and readily available. Water-based economic development that is environmentally compatible also requires co-operation in developing new and improved technology, and in transferring it effectively.

In recognition of the national leadership role it must play in this endeavour, the federal government will:

- conduct and encourage the undertaking of physical, chemical, biological and socio-economic investigations, which are directed to current and emerging issues;

- establish research advisory mechanisms with broad representation from scientific and applied research clientele, to advise on program needs and priorities;
- promote co-operative federal-provincial endeavours when the objectives are of joint interest;
- undertake and support research and technological development and transfer efforts;
- encourage opportunities for non-governmental technological development, and the growth of a private sector water conservation industry; and
- foster international co-operation in scientific and technological research and development and in data and information collection systems."

Exploring fully the 'alternate futures' approach in all water management strategies, maximizes the opportunities for multiple-purpose/multiple-means planning in water resources development.

In strategy 3,

> "The federal government endorses an integrated approach to the planning and development of water resources in order that increasing demands upon the quality and quantity of the resource are met efficiently and equitably, and in a manner that

ensures that the many values of water and related resources are recognized, and ensures the continued productivity of the resource and the ecosystems dependent upon it.

The integrated approach takes into account all water uses and water-related activities, within whatever political, administrative, economic or functional boundaries they are defined. Increasingly, watersheds are becoming the preferred spatial unit for water resource planning. It is an approach that makes sense at any scale of planning, whether governmental or private, but for the major river basins, integrated water resource planning in practically synonymous with joint federal-provincial-territorial planning. The interdependence and growing competition among water users, and the recognition of recreational, social, environmental and heritage values are additional reasons for the increasing importance of co-operative planning between the various levels of government agencies and institutions.

In support of its commitment to this strategy of integrated, long-term planning for the development and management of water and related resources, the federal government will:

- adhere to integrated water resource planning in areas of federal jurisdiction, and in interjurisdictional waters subject to federal-provincial-territorial agreements in order to ensure that all values are given full consideration;

- encourage, on the basis of a watershed, or other appropriate spatial unit, the integration of water management plans and objectives with those of other natural resource interests - fisheries, forestry, wildlife, mining, hydropower, and agriculture - to relect the unity of natural processes and the interdependence of uses and users in that spatial unit;
- establish and apply evaluation criteria to all federally sponsored projects to ensure their compatibility with federal goals respecting water management, based on an appreciation of the values of water and related resources'
- ensure that all significant national and international water-related development projects, which are supported or initiated by the federal government or for which federal property is required, are subject to the Federal Environmental Assessment and Review Process, so that potential adverse environmental and socio-economic effects can be identified and, to the extent possible mitigated;
- ensure the participation or co-operation of all

relevant co-ordinating and regulatory agencies; and

- encourage and support opportunities for public consultation and participation in the integrated planning process."

The use of legislation, proposed in Strategy 4 plays an integral role in the implementation of any policy.

> "Water resource management in Canada is governed by both provincial and federal statutes. Provinces exercise proprietary rights over the water resource and, therefore, have the authority to legislate on all aspects of water supply, use, pollution control, hydroelectric and non-nuclear power development, irrigation and recreation. The legislation passed by Parliament on water and water-related activities relates to those activities over which the federal government has jurisdiction. The statutes deal with fisheries, the protection of navigable water, shipping, some specific aspects of environmental protection, drinking water in areas of federal jurisdiction, international water management, and federal-provincial-territorial co-operation in water resources planning and management.
>
> The remedial approach of the present legislative measures dates back to the 1970's, however, and is proving to be incapable of solving all emerging

water resource issues, particularly those relating to toxic substances. There is a clear need to modernize the legislative base to make it more anticipatory and comprehensive and, to protect the health and safety of Canadians and the many values of water and related resources which have heretofore been taken for granted.

In addition, there is a need to insure that federal legislative provisions in support of federal water policy goals are coherent and consistent in approach and implemented efficiently. In the interests of efficiency, increased emphasis is required on co-operation with all concerned jurisdictions and agencies to streamline the regulatory process for management of water quality and quantity, to eliminate wasteful duplications and to reduce the regulatory burden on all Canadians.

To these ends, the federal government will renew, consolidate or otherwise strengthen the application of existing federal legislation, so as to:

- produce legislative provisions to address interjurisdictional water issues relating to levels, flows and quality;
- control and manage toxic chemicals throughout their entire life cycle - from production to disposal;

- establish water quality standards and guidelines to better protect human health and the diversity of species and ecosystems;
- encourage existing mechanisms like the Prairie Provinces Water Board and develop others to address potential provincial-territorial and interprovincial water conflicts; and
- ensure the effectiveness of regulatory measures through the provision of appropriate enforcement and compliance measures."

In Strategy 5, the federal government has recognized that the effectiveness of enforcement and compliance measures is greatly enhanced with fostered public participation and public awareness.

> "The adoption of new policies and approaches for the long-term protection and management of Canada's water resources requires a fundamental change in attitude towards the value and importance of water and related resources to society, the economy and the environment. But, this effort will be "too little, too late" unless concerted efforts are undertaken to make Canadians fully aware of the pressures on their water resources and, therefore, on themselves and their environment.
>
> The federal government recognizes a primary need for increasing public awareness with respect to

water and encourages the media, education authorities and non-governmental organizations to do likewise.

The federal government acknowledges the necessity of providing opportunities for public input on water decisions that have broad social, economic or environmental implications. A well-informed public and clearly defined channels for public participation provide the best assurance that water management decisions will take into account the full spectrum of public values.

In order to promote public awareness and public participation in programs and initiatives to improve and protect Canada's resources, the federal government will:

- ensure that the public is consulted and that its views are considered in all major federal water management decisions;
- encourage public participation and initiate, develop and deliver a national water conservation awareness program;
- encourage the efforts of provinces and non-governmental organizations in public information and awareness; and,
- ensure public access to information on the extent and health of water resources through appropriate means, including a State of the Environment

> reporting system."

Within in this framework, the

> "implementation of the Federal Water Policy is the responsibility of all departments and agencies of the federal government. Because responsibilities for water management are highly dispersed among provincial and territorial governments and federal departments, its successful implementation will depend upon harmonious institutional arrangements for co-ordinating the efforts of the governments concerned and their respective agencies.
>
> At the the federal level, the government will:
>
> - ensure the effective co-ordination of federal water policies among federal departments and agencies;
> - ensure a regular review of the water-related policies and programs of all federal departments to assess the degree to which these policies and programs are supportive of federal water policy;
> - reconcile the water policy positions of all federal departments to promote co-ordinated and thoughtful federal approachl;
> - ensure amendments or additions to federal water policy as appropriate; and
> - apply the Environmental Assessment and Review Process to examine federally sponsored water-related developments and projects.

To achieve effective implementation of the policy, the federal government has designated the Interdepartmental Committee on Water (I.C.W.) as the focal point for co-ordinating the policy among federal departments and agencies. As part of its responsibility, I.C.W. will produce an annual report on the overall implementation of federal water policy, on the strengths and weaknesses of that policy's delivery and on areas for future examination; it will also serve as a focal point for explaining federal water policy and for providing integrated information on all aspects of that policy; and co-ordinate such interdepartmental studies as may be necessary to fulfil its terms of reference, and constitute subcommittees as may be appropriate to address particular problems or issues related to water policy.

At the federal-provincial-territorial level, the adoption and application of policy goals and strategies will be encouraged through existing and improved federal-provincial co-ordinating mechanisms and bilateral arrangements, which include:

- consultation and information exchange so as to encourage compatible water policies and co-operative programs through forums such as the Water Advisory Committee of the Canadian Council of Resource and Environment Ministers (CCREM);

- support for formal and informal consultative or advisory committees to deal with either a single issue or a range of water problems;
- intergovernmental agreements for co-operative programs with all provinces/territories; and
- special agreements to respond to a particular water problem or issue in one or more of the provinces or territories.

At the international level, the policy will guide Canadian officials in their future bilateral and multilateral dealings with other national governments on water-related programs and activities."[8]

The five strategies, outlined in the Federal Water Policy, provide a relatively exhaustive framework for the planning, programming and administration of a federal water resources development program. The implications of these five strategies on each of the six development areas in Alberta water resources development , through Federal Government water resources development strategies, are included in the following six sections.

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[8] Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
pp. 8-13.

2.2.1 DIVERSIFICATION IN WATER MANAGEMENT

> Instream Resource Values..."are important in developing both user-pay schemes and in basin planning. They must represent economic, social and environmental components."
> [9]

Water management within the federal government is a particularly broad and highly diversified program. Many of the federal programs in water management are conducted in co-operation with other federal government agencies involved in water management. In Alberta the Prairie Farm Rehabilitation Administration has been particularly active in the operation of reservoirs and irrigation systems. The Department of Public Works has had limited operations in Alberta in the operation of certain dams and canals and the dredging of shipping canals. The operation of navigational systems is also maintained by the Department of Transport. The Department of Indian Affairs and Northern Development has been involved, in Alberta, with water management on

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[9] from correspondence with J.D.McTaggart-Cowan, Ottawa:Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources (1986)

Indian Reserves and assessments of the impacts of federal national policies on territorial water management practices.

> "The standards of water supply and sanitation on the native reserves in some parts of Canada are much lower than in many developing counties.
>
> - There are an estimated 330,000 Indians in Canada; approximately 70 percent or more than 220,000, lived on reserves in 1984.
> - The majority of Indian Reserves in northern Alberta lack proper water supply and sewage disposal facilities. In Saskatchewan and Manitoba, where Indians represent between 4 and 5 percent of the population, fewer than 15 percent of the on-reserve houses had running water in 1977 and fewer than 10 percent of the houses had sewers or septic tanks.
> - Only 50 percent of the on-reserve Indian houses across Canada have running water; more than 100,000 Canadian Indians live in houses without running water."[10]

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[10] Science Council of Canada, Water 2020: Sustainable Use for the 21st Century. Ottawa: Government of Canada. 1988. Page 11.

"In its sphere of influence, the federal government is striving to balance the goal of maintaining natural conditions for streams (and protecting traditional uses) with the endeavours of others whose goals are directed to resource or economic development.

In recognition of native peoples special interests in water, the federal government will:

- Negotiate land claims settlements that define use and management powers for waters within claimed areas;
- review and clarify with native people their water-related issues and interests with respect to their treaty areas as well as to lands subject to land claims;
- improve understanding of native needs and commitments associated with water;
- determine, in consultation with native people, how they will participate in resource management programs affecting water resources of interest to them; and
- encourage greater native participation in water allocation and management decisions involving instream and traditional uses."

11

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> Aboriginal rights and the "Settlement of claims may impact on land and water use planning activities in certain specific areas and could affect large scale projects, but in other areas could have no impact at all."

2.2.2 QUALITY OF LIFE

> "Canadians have shown a growing awareness of and concern about the complex and serious problems they perceive as threatening their health and as outpacing the ability of governments to solve.
> These concerns include: the management of toxic chemicals and their effects on various water uses, particularly on drinking water; rapidly increasing water demands in water-deficient regions; the deterioration of municipal water supply and sewage treatment infrastructure; implications of climatic change; and potential large-scale interbasin transfers of water. But, in spite of such growing recognition of water as essential for the life and health of people and ecosystems, the resource continues to be taken for granted, undervalued and, consequently, overused and abused."

Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 31.

12

Human activity on water resources is ranked as being of foremost importance by the Office of Environmental Affairs in the Ministry of Energy, Mines and Resources.

> "Human activities impact both directly on water resources (diversions, irrigation, drainage, withdrawal) and indirectly by causing problems which require action (pollution, destruction of habitat, etc.)"

13

Within the water resources development sector, constant reviews must be given to the impact on fish habitat.

> "Fish habitats, the rivers, streams and lakes on which depend for their life process are hidden assets, which form the foundation of Canada's fisheries. It is, therefore, important that they be conserved from degradation and restored to their earlier potential where sufficient benefits can be expected. Commercial and recreational freshwater

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Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 1.

13

from correspondence with J.D. McTaggart-Cowan,
Ottawa: Director, Office of Environmental Affairs
Ministry of Energy, Mines and Resources (1986)

fisheries make a significant contribution to the overall economy. The fishery resource also plays an important role in supporting native lifestyle and remote communities.

Fish habitats are susceptible to harm from a variety of sources. Direct discharges of industrial, municipal and agricultural effluence, and physical change resulting from instream construction activity are the most visible sources of change. In addition, acid rain and airborne pollutants can threaten fish habitats.

The federal government released a national Fish Habitat Management Policy in October, 1985, which committed it to achieving a net gain of productive fish habitat for the benefit of Canadians. In support of this goal, the federal government is committed to three strategies; conservation, restoration and development. The implementation of these strategies in areas of direct federal jurisdiction will ensure that Canadians continue to benefit from the frewshwater fishery resource.

In co-operation with project proponents the federal government will support the achievement of net gain through use of the principles of no net loss. To meet this commitment, the federal government will:

- develop national guidelines for the achievement of no net loss through incorporating fish waterfront protection requirements into land and water use projects that could affect fish habitat;

- participate in and encourage intergrated resources planning that will allow for the incorporation of fish habitat conservation measures early in the planning process;
- conduct scientific research to provide the information and technology necessary for the conservation, restoration and development of fish habitats;
- encourage and support involvement by government agencies, public interest groups and the private sector to conserve, restore and develop fish habitats and promote the establishment of national and regional committees, foundations or boards to work co-operatively with the Department of Fisheries and Oceans; and
- undertake monitoring and assessment of fish habitats in support of federal fish habitat management goals and objectives."

14

14

Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 20.

Many of the departments in the water management sector, that influence the quality of life of Canadians, perform a regulatory function. Such departments include the Department of National Health and Welfare, Fisheries and Oceans, Transport and the Atomic Energy Control Board. Of these departments, National Health and Welfare has commanded the highest profile in Alberta in monitoring the human health aspects of drinking water and the regulation of environmental contaminants.

The strategy employed in the Federal Water Policy to address the issues of water quality management state that;

> "The key to successful water quality management is the prevention of pollution before it occurs. The quality of water determines its suitability for use. Despite Canada's record for good environmental management, there are areas of the county where water quality conditions are worsening and many others are potentially threatened. Even when sufficient quantities of water are available, poor quality can be a limiting factor in its use. This problem is further aggravated when both water quantity and quality are limited.
>
> There is ample proof that the direct costs associated with clean-up of impaired water quality are high, not to mention the indirect costs

associated with health and other problems associated with water of inferior quality. As a result one of the main thrusts of federal water policy is the prevention of water pollution.

The Canadian Water Quality Guidelines have been developed to protect water bodies for various uses, such as irrigation and recreation. The guidelines are also used to develop water quality objectives for the protection of users at the given location. The objectives indicate whether aquatic life in a water body is under stress or if pollution control measures are necessary. To be most effective, these matters depend on federal-provincial co-operation and on the support of environmental groups and the public.

The federal government will undertake, promote and encourage the protection and enhancement of the quality of water for the beneficial use of present and future generations.

To meet this commitment, the federal government will:

- develop and apply, in co-operation with the provincial governments, appropriate strategies for identifying the nature and extent of the impairment of water quality;
- develop, with provincial governments, Canadian Water Quality Guidelines that are relevant to

Canadian environmental conditions and encourage a uniform approach to establishing water quality objectives across Canada for the preservation of water quality;

- undertake, encourage and support measures to protect water quality;
- undertake, encourage and support water quality management through research and development; and
- seek to ensure that international and interprovincial water quality requirements are met."

Under the Federal Water Policy;

Protection and restoration of the integrity and wholesomeness of the nation's drinking water is a shared responsibility of the federal, provincial and municipal governments. Under the Constitution Act, provincial governments are generally responsible for ensuring potable community water supplies and the federal government has specific responsibility for areas under its jurisdiction, such as international and interprovincial carriers, federal lands and installations, and Indian Reserve.

Significant progress has been made by governments in controlling and treating viable sources of pollution. Public confidence in the safety of its drinking water is being shaken owing to the increasing number of potentially toxic substances being detected in water supplies.

The federal government is committed to ensuring safe drinking water within areas under its jurisdiction and to promoting and encouraging a consistent approach to protection and improvement of the nation's drinking water by provinces, territories and local governments.

To meet the commitment, the federal government will continue to:

- consider legislation to ensure the safety of drinking water within federal jurisdiction and to complement provincial and territorial programs;
- establish national drinking water quality guidelines to help all jurisdictions in setting safe drinking water standards;
- conduct research and support technological development and transfer in drinking water treatment processes; and
- promote public awareness and understanding of critical issues respecting drinking water safety, such as prevention of contamination of drinking water sources from land area runoff."

Only modest attention has been paid to ground water resources on a national scale because the nation's surface water supplies are so large.

Adequate data and information bases are essential starting points in addressing ground water concerns. But, if the federal government must also develop the expertise needed to interpret that information and to develop and implement solutions. For these reasons, the federal government perceives a need to upgrade its knowledge and databases on ground water to meet federal requirements. Some provinces have indicated that they would welcome federal assistance in addressing their ground water problems and many have developed excellent ground water databases.

The federal government is committed to the preservation and enhancement of the ground water resource for the beneficial uses of present and future generations.

To meet this commitment, the federal government will:

- develop, with provincial governments and other interested parties, appropriate strategies, national guidelines and activities for gound water assessment and protection;
- conduct research and undertake technological development and demonstration projects in response to ground water problems;
- develop exemplary ground water management practices involving federal lands, responsibilities, facilities, and federally

funded projects;

- develop measures to achieve appropriate ground water quality in transboundary waters; and
- provide information and advice on ground water issues of federal and national interest."

[15]

> The "supply and quality of groundwater is a major issue facing the prairies. Very little basic information is known about groundwater movement in Canada. This concern reflects the potential for a major research need."

[16]

Other programs designed to improve the quality of life include emergency planning strategies which have involved the coordination of federal government flood relief and disaster compensation programs.

Although Alberta is not full a participant,

> "Under the auspices of federal-provincial-territorial bilateral agreements, flood-risk areas

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[15]

Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
pp. 18-22.

[16]

with correspondence with J. McTaggart-Cowan
Ottawa: Director,Office of Environmental Affairs
Ministry of Energy, Mines and Resources (1986)

are identified and designated, and further vulnerable developments in those areas are discouraged. Where existing development warrants, flood protection works may be constructed.

The full range of flood-protection alternatives includes flood-risk mapping, flood warning and forecasting, flood routing through property easements, land-use adjustments through zoning and acquisition, flood-proofing of structures, and traditional structural solutions such as upstream storage, stream straightening, flood by-passes and dykes.

The flood damage reduction program focusses primarily on centres of population in high-risk areas where potential flood damage could exceed the threshold level for the federal disaster assistance program, but it can include suburban and undeveloped areas with a high potential for development.

The federal government is committed to alleviating human suffering caused by floods and minimizing the costs of flood damages.

To meet this commitment, the federal government will:

- co-operate with the provinces and territories in compiling appropriate data that will make it possible to identify areas of flood risk and discourage inappropriate development in those areas;

- provide the public with information on floods, federal policies and programs and on the susceptibility of specific areas to flooding;
- after designation, neither support nor provide disaster assistance coverage to new flood-vulnerable development;
- consider contributing to flood-control works to protect existing development where federal interests are threatened or where flood damages are likely to have significant national implications;
- provide for assessment of the effectiveness of various flood-protection alternatives, taking into account costs, benefits and environmental impacts, and encouraging the best combination of alternatives for an agreed level of protection; and
- encourage assessments of the environmental impact and social implications of large flood-control structures."

By comparison, drought conditions are far more prevalent in Alberta under the Federal Water Policy,

> The Federal Government is prepared to support provincial initiatives directed to managing water supplies to realize their full value and to

resolving real and potential problems associated with droughts.

To this end, the federal government will:

- encourage and promote water demand management approaches and conservation technology with a view to extending the use of limited supplies;
- undertake, support and promote research into improving understanding of droughts;
- encourage the development and dissemination of water conservation technologies and practices to promote the best use of current supplies; and
- encourage an integrated approach to planning and managing the augmentation and allocation of water supplies."

The primary goal of the federal government is to ensure a secure environment. Four key strategies have been identified in environmental management.

(i) Cleanup
(ii) Conservation
(iii) Prevention
(iv) Adaption

"In a secure environment, cleanup involves certain important elements:

- quick arrest and containment of both human-made threats (e.g. toxic spills) and certain natural threats (e.g. floods)

- restoration of areas damanged by accidents or past activities, and
- fair and timely assistance to individuals or communities disrupted by environmental accidents or newly recognized threats

As we more towards a secure environment our cleanup efforts will need to

- improve efforts to implement ongoing, routine cleanup so as to prevent future emergencies
- systematically identify and tackle the backlog of existing cleanup requirements, respecting local, regional and national priorities
- pay greater attention to restoration and rejuvenation of areas affected either by toxic spills or past commercial activity
- improve legal and other assistance measures to provide equitable and timely help for persons affected by environmental accidents

For a secure environment conservation must meet one fundamental condition which is the wise and efficient management and use of renewable and non-renewable resources. Future conservation efforts will need to pay attention to three critical areas:

- broaden the idea of conservation to embrance all facets of our economy and culture as well as continuing to protect critical habitats and species

- in addition to conserving critical resources, take into account the inter-relationships among them, including conflicts in use
- overcome the notion still held by some people that conservation is incompatible with economic growth, through greater attention to long-term, sustained productivity

The challenge in prevention for a secure environment will be the adoption of individual, social and corporate attitudes and practices which minimize the occurence of environmental problems. Prevention efforts will need to be strengthened in three ways:

- increase our capacity to anticipate and prevent potential threats
- broaden the concept beyond immediate threats to life and property to include concern for quality of life (including better health, peace of mind, reduced exposure to risk)
- increase attention to more subtle cumulative and longer term threats to health and safety

The notions of adapting and coping are not yet common to environmental management. Yet two concerns are crucial:

- anticipating of, and planning for new or potential threats and environmental trends
- adaption to, and coping with environmental realities, which are beyond our capacity or

willingness, to change.

Greater attention must be given to adapting and coping with environmental trends and realities. This will mean:

- turning our attention to long-term, macro-scale environmental trends, even though their impacts may not be felt until well into the future
- coming to terms with environmental trends and realities which we cannot change, or choose not to change, by shifting our emphasis from adapting the environment to adapting to the environment
- better equipping individuals and communities to cope with environmental realities."

17

2.2.3 BALANCED REGIONAL GROWTH

Within Alberta, numerous federal agencies have been involved in programs promoting balanced regional growth.

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[17] Environment Canada. Into the Mainstream: Strategies for a Secure Environment. Ottawa: Government of Canada. 1988. Pages 9-11.

"Alberta does have significant water withdrawals for mining, manufacturing (enhanced oil recovery), and heavy oil/bitumen extraction and upgrading. The potential conflicts between agriculture, livestock, industrial and hydroelectric water demands will probably be a significant issue for Alberta in the 1990's, particularly in the south of the province."[18]

Concurring views have been expressed by a respondent for Environment Canada and Agriculture Canada:

> "I believe that there will be greater demands for a larger share of the available water (for industrial water use) as the province attempts to diversify its economic base."

> Industrial water use is assigned a high priority status as...."with increasing industrialization, demands will increase, as will the need for careful management and control."[19]

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[18] from correspondence with J.D. McTaggart-Cowan Ottawa:Director,Office of Environmental Affairs Ministry of Energy, Mines and Resources (1986)

[19] from correspondence with C.W. Lindwall

The management of toxic chemicals has arisen largely as a byproduct of industrial development.

> "The impact of toxic chemicals on human health and the environment is becoming an increasingly pressing issue facing Canadians today. Estimates vary, but it is commonly believed that there are up to 100,000 chemicals in commercial use throughout the world, with about 1,000 new ones entering the market every year.
>
> In the past, response to threats to the environment took place after problems developed, after which offending discharges or effluents were recovered, treated or contained. Toxic chemical contamination, however, is more difficult to deal with. The traditional approach to pollution treatment is no longer enough. Ordinary sense perception cannot identify chemical contamination, but science is increasing its capacity to detect the presence of toxic substances in the environment and at extremely low levels.
>
> As with many other issues in Canada, the management of toxic substances is divided between the federal and provincial governments. At the federal level alone, 24 departments administer a total of 58 Acts of Parliament dealing with various aspects of the

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Lethbridge: Head, Soil Science Section
Research Branch, Agriculture Canada (1986)

control of chemicals. Many of these Acts and their regulations were developed in response to specific problems. The result was a "patchwork quilt" of legislation and regulations. Duplication and overlapping jurisdiction make it difficult for industry to comply. Worse still, there are gaps which make it difficult for governments to come firmly to grips with certain types of toxic chemicals.

To meet this situation, the federal government is enacting the Canadian Environmental Protection Act, a proposed statutory framework emphasizing an anticipatory and preventive approach to clarifying, co-ordinating and modernizing the federal environmental thrust. The framework would assist governments in controlling toxic chemicals throughout their life-cycle, that is, from their development, manufacture, transport, distribution, use, and storage, to their ultimate disposal. This "cradle-to-grave" management approach will cover both new and existing chemicals. New chemicals would have to be tested and their environmental and human health effects minimized before introduction into the Canadian market place. Existing chemicals would have more stringent controls applied to them as a result of more detailed testing and evaluation.

The federal government is committed to adopting a streamlined and consistent framework for dealing with toxic chemicals in Canada.

To this end, the federal government will ensure the establishment of:

- controls so that life-cycle of chemicals is properly managed;
- guidelines and objectives for federal departments, agencies, Crown corporations and regulatory bodies to ensure efficient and effective delivery of environmental protection programs;
- national environmental quality objectives and guidelines in co-operation with provinces, territories, industry and other sectors representative of Canadian society; and
- enforcement and compliance measures in relation to the Canadian Environmental Protection Act."

20

Agriculture Canada has promoted water resource development as a catalyst for improved farm productivity. In a similar fashion the Prairie Farm

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Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 17.

Rehabilitation Administration has conducted programs improving water supplies systems to farms and farm based communities.

> Agricultural water use is forecast for "continued pressure for water use, although the economics of irrigation may not be favorable when salinization costs are included for cost/benefit analyses for projects."

21

Such concerns are echoed in the Federal Water Policy which states that...

> "governments need to assess carefully and consider the economic costs and environmental consequences associated with irrigation to ensure maintenance of the agricultural base and protection of other water and related resource values.
>
> When proposals for irrigation are consistent with federal and provincial priorities, the federal government will:
>
> - continue to support the best possible use of existing irrigation facilities through research and encourage efficient water use;
> - support new development under economic

21

from correspondence with R. Prach
Edmonton: Respondent, Canadian Wildlife Service
Environment Canada (1986)

development agreements, but only when it is based on a comprehensive set of considerations including:

  - availability of long-term market opportunities;
  - potential for diversification and value-added processing;
  - improvement in the viability of rural communities;
  - improvement in the level and stability of profit for individual farmers;
  - opportunities for other complementary multiple water uses; and
  - availability of a comprehensive environmental and economic impact assessment of local, regional and national economies.
- encourage evaluation criteria consistent with federal development initiatives including social, environmental and economic factors, and opportunity costs;
- encourage the development of realistic pricing and water conservation technologies and programs, and information programs directed to water conservation; and
- ensure that international and interprovincial apportionment requirements are met."

22

Diversification of water resources in Alberta will likely be subject to significant change, because, water supplies for individual industries and community infrastructures have fallen under the jurisdiction of the Department of Regional Industrial Expansion, currently in the process of becoming the Department of Science and Technology.

> "Canadians are concerned about municipal and industrial pollution and its effects on environmental and other values. They also fear the long-term effects of all undesirable substances, whether natural or man-made, in their drinking water. Traditionally, water has been viewed as an unlimited resource to be offered to the user at little or no cost.
>
> Municipal water and sewer systems are areas of provincial/municipal responsibility. From 1960-1980, a period of rapid urban expansion, the federal government provided loans and grants for the construction of main trunk sewers and sewage

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[22] Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 25.

treatment plants and later for certain water supply systems. The program, which provided an added incentive to provincial/municipal action was terminated in 1980 when fiscal restraint brought federal assistance in an area of provincial/municipal responsibility into question. However, municipal water and sewer infrastructure can be considered under other federal programs, such as economic development and job training, if federal and provincial priorities coincide, and if the proposal meets the objectives of such programs.

Concern about the state of existing water and sewer systems has now been added to the need for the construction of new facilities. In fact, proposals have been made by other levels of government for federal cost-sharing for repair and upgrading of a wide range of municipal infrastructure - roads, bridges, sidewalks, as well as water and sewer systems.

In terms of water and sewer systems, realistic pricing for these services would encourage users to conserve water, raise the funds needed to built and maintain these costly systems, and encourage efficiencies and greater effectiveness through innovation.

Major government funding of water and sewers without such realistic pricing leaves consumers unaware of the true cost of the resource use, and the water tends to be wasted through excessive demand and insufficient use.

The federal government will encourage the development of a Canadian industry to produce the goods and services needed for municipal water and sewer infrastructure.

For its part, the federal government will:

- participate with provinces in the examination of costs and pricing of municipal water supply and treatment;
- advocate the pricing of water and sewer services at a level suitable to meet the development and rehabilitation of these services;
- implement proper environmental and health practices with respect to federal undertakings;
- participate with provincial and municipal governments in developing the requirements and programs to deal with industrial discharges to municipal treatment systems;
- undertake, support and promote research, development and transfer of new wastewater treatment technology; and
- consider financial assistance for projects that meet federal and provincial development priorities and are eligible for assistance under

existing federal program."

23

To improve the delivery of federal government agricultural programs, the general conditions and recommendations of the Nielsen Report (1985) could be equally applied to the specific planning and development of programs in the water resources sector.

> "The agricultural review encompassed 40 direct expenditure programs involving $2.7 billion, as well as tax expenditures valued at more than $500 million. It included programs of Agriculture Canada and it's agencies, Transport Canada, Consumer and Corporate Affairs Canada, Environment Canada, Health and Welfare Canada, and External Affairs programs that relate to grains and oilseeds. Agriculture Canada's objectives for the agri-food sector are agricultural sector growth, competitivenes and stability, and these objectives were adopted in conducting the review."
>
> Within the Nielsen Report, "The Government reaffirms that it's basic objective for Canada's agri-foods are growth, competitiveness and

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23

Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987.
Page 21.

stability of the sector. The Government recognizes that a new approach is needed to achieve these basic goals, and involves the following elements:

> The principle that the agricultural and Governmental programs and activities should be approached in a business oriented and market sensitive manner;
>
> Increased emphasis on improved coordination and integration of Federal Government programs and services in support of private sector initiative;
>
> Reorientation of Federal programs in a forward looking, cost effective direction, with strengthened Federal-Provincial cooperation to minimize distortions in production and investment and to remove impediments to productivity gains;
>
> The minimization of subsidy measures that do not constitute basic framework programs to manage economic risk or that do not clearly define economic development objectives."[24]

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[24] Nielsen, E. New Management Initiatives: Initial results from the Ministerial Task Force on Program Review. Ottawa:Government of

In support of the reccomendations of the Nielsen Report, the provincial and federal governments need to carefully assess and consider the economic costs and environmental consequences associated with all water resources development programs to ensure the maintenance of balanced regional growth and the protection of other water and related resource values.

Canada. (1985). pp. 35-36.

2.2.4 RESOURCES DEVELOPMENT

"Traditionally, water management in Canada has been focussed upon harnessing, storing, regulating and diverting supplies to accommodate needs. This approach was convenient when the demand was small, but the growth in demand is resulting in user conflicts. Costs of meeting such demands has escalated, has has public opposition to the adverse social and environmental effects often associated with them. The need has arisen to explore alternative means of meeting demands and resolving such conflicts. The key is pricing, both in the literal sense of realistic charges for water services, and in the general sense of taking the resource's many values into account where direct charges are not pertinent.

In western societies, most resource allocation is accomplished through the use of the price system and the interplay of forces of supply and demand. Low prices or absence of pricing often leads to overuse and deterioration of the resource - especially resources such as water, which are held in common. Typically, water in Canada is under priced if it is priced at all. Consequently, development of appropriate pricing mechanisms to help allocate water is seen as an effective way to encourage effective water use. Furthermore, suitable pricing would not only create an incentive to avoid waste and reduce demand for expanded services, but it would make the user more conscious of the value of water, ensure that water be allocated to more beneficial uses, facilitate cost recovery, alleviate conflicts and promote development of new conservation technology.

The federal government is prepared to undertake initiatives associated with its own mandate as well as to support provincial initiatives directed to meeting water demands and resolving real and potential conflicts. To this end, the federal government will:

- develop water demand management approaches in areas of federal jurisdiction with regard to varying social and economic conditions, and for intangible heritage and recreational values and encourage other jurisdictions to do the same;
- undertake, support and promote research into establishing appropriate prices for water, identifying areas of potential user conflicts, and encouraging the development and transfer of water conservation technology and practices.
- encourage an integrated resource planning and management approach to augmentation and

allocation of water supplies in order to ensure that the full range of values are considered; and

- promote and support public awareness and public participation in water conservation."

25

Within the resource development sector, hydroelectric generation and other projects in which water resources are used in energy production has involved cooperation of the Department of Energy, Mines and Resources.

> "High-cost fossil fuels are making small scale and low- head hydro appear increasingly attractive.
> There are clear economic advantages in installing small scale units in isolated communities that rely on diesel-electric generation and which have little likelihood of integration into an electrical network. The resulting technology would also have an export potential to developing countries.
> In order to ensure that long-term federal interests are met, the federal government will continue to:
> - contribute to energy and research development, particularly when small-scale and low-head technology are involved;
> - encourage integrated planning at sites where

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[25] Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987. Page 23.

federal interests or financial support are involved or where more than one province is affected.

- compile and disseminate national statistics on dams and electric power in Canada; and
- encourage use of Environmental Assessment and Review Process, or a provincial equivalent, so that the potential adverse environmental and socio-economic consequences can be identified before implementation and, to the extent possible, mitigated."[26]

"Alberta is ranked third of the provinces and territories in the technically developable potential it has for hydroelectric power capacity. This could be a highly significant sector for development in the 1990's."[27]

In a similar forecast - an Agriculture Canada respondent stated that the Hydroelectric generation potential of Alberta - "will continue to be a very important source

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[26] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Page 27.

[27] from correspondence with J.D. McTaggart-Cowan
Ottawa: Director, Office of Environmental Affairs
Ministry of Energy, Mines and Resources (1986)

of power."
28

An issue of growing importance and complexity in the development of hydro-electric projects is the use of inter-basin transfers.

> "Historically, most diversions in Canada have been designed to increase hydro-electric power generation. The social and environmental effects of large diversions in Canada only started to receive consideration in the 1970's. With a few exceptions, inter-basin diversions have been contained within provincial boundaries, however, proposed new diversions to meet either growing needs in water short areas, to forestall the potential impact of climatic warming or to export water to foreign markets, threaten serious inter-jurisdictional impacts and conflicts.
>
> The federal government advocates exercising caution in considering the need for major inter-basin tranfers and endorses other less disruptive alternatives such as demand management and water conservation to satisfy societal needs without sacrificing water related values to irreversible actions.

28
from correspondence with C.W. Lindwall
Lethbridge: Head, Soil Science Section, Research Branch
Agriculture Canada (1986)

In support of this view, the federal government will:

- draft guidelines and criteria for assessing inter-basin transfers within Canada in co-operation with the provinces/territories:
- take all possible measures within the limits of its constitutional authority to prohibit the export of Canadian water by inter-basin diversions; and strengthen federal legislation to the extent necessary to fully implement this policy; and
- develop with concerned provincial governments a mutually acceptable referral system to ensure that provincial licensing of small scale transfers of water (local arrangements between communities, or containerized transfers) between jurisdictions take into account federal interests respecting navigation, fisheries, environmental protection, Indian Treaties and trade considerations."

Apart from these strategies to ensure the most expedient use of inter-basin transfers, the Canadian Heritage River System (CHRS) also serves conceptually as a check in the progress of certain water resources developments.

"The primary objective of the CHRS is to ensure that rivers are outstanding examples of Canada's natural heritage, that have played a significant part in Canadian history or that offer outstanding opportunities for recreation are managed in such a way that their distinctive heritage values are conserved while their potential for future public use and enjoyment is enhanced. The program is seen as a long-term one to designate and preserve nationally significant areas in which rivers are the predominant features. As of the 1st of January 1987, thirteen sections of twelve different rivers across Canada have been nominated to the CHRS; four of them are now designated as "Canadian Heritage Rivers".

To ensure that Canada's river heritage is preserved and managed for the use and enjoyment of all Canadians, the federal government will:

- co-operate with provincial and territorial governments through the Canadian Heritage River system to give national recognition to Canada's important historic, natural and recreational rivers or river segments, regardless of which government has jurisdiction over these waters;
- staff and operate a secretariat for the Canadian Heritage Rivers board;
- provide technical and financial assistance to provincial and territorial governments for studies leading to the nomination of rivers to

the Canadian Heritage River system and for preparing plans for the rivers, once nominated; and

- publicize the Canadian Heritage Rivers system both nationally and internationally."

Further conservation strategies have been undertaken in Wetlands preservation.

> "Wetlands have been recognized as one of Canada's most productive eco-systems, providing essential habitats for many species or waterfowl, fish, furbearers and other wildlife, including rare and endangered species. Social benefits include recreational, educational, scientific and aesthetic opportunities.
>
> Since settlement time, degradation and land-use converstions of Wetlands related to the development of agriculture and expansion of urban, port, marina and hydro-electric facilities resuted in a major depletion of Canada's Wetland resource base. Conservation is essential in maintaining the substantial economic benefits derived annually from wetlands as a result of hunting, trapping, fishing and harvesting of forest peat and other natural products.
>
> The federal policy is to conserve in advance Canada's wetlands through short and long term action co-ordinated with other governments, private

organizations, land owners and the public. Accordingly, the federal government will contribute to this effort by:

- reviewing and seeking to minimize the negative impact of federal policies, programs and activities in wetlands;
- identifying, conserving and managing wetlands of importance on federally owned or regulated lands;
- co-operating with other governments in conserving and managing wetlands which serve important hydrological roles associated with improving water quality, sustaining water quantity and moderating flood events;
- encouraging appropriate land-use practices, integrated land and water resource planning, and application of environmental assessment processes and practices to mitigate undesirable effects on existing wetlands;
- conducting and promoting research to provide scientific and technological support for understanding of wetland functions and values;
- pursuing co-operative international and federal-provincial habitat protection, research and management programs for fish and waterfowl, as agreed under treaties, conventions and other bilaterial agreements; and
- promoting public awareness of wetland values and

> public participation in the conservation of wetlands."

29

Other issues which address the management of water as a resource are addressed by the Department of Science and Technology with federal research and policy development.

> "The scope for new and improved technological efficiency in water use and supply is broad, and the benefits appear to warrant a more conceited effort on the part of governments, in partnership with the private sector, to pursue and support developments in this area. The federal and provincial roles in technological development and transfer are complementary, with regional leadership coming from latter and national leadership from the former.
>
> In meeting its role the federal government will:
>
> - support research directed to technological developments;
> - demonstrate national leadership by undertaking, supporting and promoting technological research, development and transfer;
> - co-ordinate federal and provincial efforts through such forums as the Research and

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29 Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Page 24-29.

Development Co-ordination Committee of the Canadian Council of Resource and Environment Ministers;

- facilitate the transfer of technology between Canada and other countries; and
- implement appropriate technologies to meet federal responsibilities at federal facilities.

Under the federal government's constitutional responsibilities relating to census and statistics, it ensures that a basic level of data and information on Canada's water resources is available to protect the health and well-being of Canadians and provide a basis for sound economic development. The federal government is committed to maintaining co-operative data programs with the provinces and territories in the interest of understanding and managing the resource for the commond good.

To this end, the federal government will:

- work with the provinces and territories to produce reliable and timely data and information on the quantity, quality and variability of the nation's water resources;
- encourage the extension of data programs into the North and generally remote areas;
- maintain and promote the use of the range of national water data bases, as well as a

comprehensive directory of water-related data and sources of such data and information;

encourage the integrated planning of information gathering systems;

- augment certain data holdings on, e.g. water use, water pricing, or groundwater when they are needed to deal with new issues;
- undertake and promote new technology appropriate for general use across Canada; and
- implement cost recovery policies for data and information, recognizing that basic data constitutes the common good.

To encourage a healthy and creative water science community in Canada, the federal government supports the concept of centres of excellence that can respond to fundamental questions of water research. Its national role also includes the need to provide assessments of the current and emerging needs of water research and to participate as a full partner in the world science community.

The federal government recognizes this responsibility and, to meet it in the most effective way, proposes to maintain a continuing commitment to;

- providing leadership in water research directed to supporting national and scientific regional requirements;

- establishing research advisory mechanisms, with broad representation from the research clientele, to advise on research needs and priorities;
- conducting targetted research, applied research and experimental development directed to current and emerging water issues important to the federal government;
- conducting and encouraging research on the value of water and its many uses;
- regionalizing research efforts so that, when feasible, issues will be dealt with in the region in which they arise; and
- co-operating with, and encouraging private sector research efforts by supporting commercial access to government research facilities."

30

2.2.5 FOREIGN MARKETS

Foreign markets development is dependent primarily on the economics of water export.

> "Water export by diversion is a national issue. The aspects of licensing, environmental perturbations and impact on adjacent watersheds

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[30] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Pages 39-41.

> make export of water more than a matter of provincial economics."

31

The negotiation and implementation of international trading agreements in diversion, pricing and sale of water resources, originating in Alberta, would certainly influence the development of foreign markets.

> "The truth is that Canada, which occupies 7% of the world's land mass, has 9% of its renewable water. So, we have just about our fair share. Even that fact, however, is misleading. About 60% of Canada's fresh water drains north, while 90% of our population lives within 300 kilometres of our southern border. In other words, to the extent that we Canadians have lots of water, most of it is not where it is needed, in the populated areas of the country. In those populated areas where it is plentiful, water is fast becoming polluted and unusable. The overall problem in the country is compounded by drought in certain regions. Put simply, Canada is not a water rich country.
>
> That is why the Government of Canada emphatically opposes large scale exports of our water. We have another reason for our opposition; the inter-basin

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31
from correspondence with J.D. McTaggart-Cowan
Ottawa: Director, Office of Environmental Affairs
Ministry of Energy, Mines and Resources, (1986)

diversions necessary for such exports would inflict enormous harm on both the environment and society, especially in the north, where the ecology is delicate and where the effects on Native cultures would be devastating."

32

Furthermore..."At this point in time, neither the federal nor the provincial government has the ability to deal with large scale diversion. Small scale intrabasin damming for hydroelectric generation can be dealt with at the provincial level and when export of electricity occurs to the U.S., the federal government becomes involved. The question of sale of water has never been truly debated and the issue of provincial ownership and control over transboundary water resources needs to be resolved before any trade is initiated. It is an issue which must be settled in the next decade and the use of federal/provincial water boards to manage trade of this sort should be considered."

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32

T. McMillan, P.C., M.P. Federal Water Policy.
Ottawa: Environment Canada. 1987. Page i.

33

from correspondence with J.D. McTaggart-Cowan
Ottawa: Director, Office of Environmental Affairs

2.2.6 INTERNATIONAL RELATIONS

"The general objectives of the federal government's international water management activities are to maximize the potential economic benefit to Canadians by encouraging international, multilateral and bilateral collaboration in the development of water management knowledge, expertise in technology; to provide humanitarian assistance in alleviating water problems; and to encourage to reduction of environmental damage by man to the biosphere. The federal government is obliged to assess the environmental effects when considering assistance to other nations.

The federal government is committed to increase collaboration with other nations in freshwater research and management, and to encouraging other levels of government, research institutions and industry within Canada to co-operate in such international collaboration and to protect and advance Canada's economic interest abroad.

To achieve these commitments, the federal government will continue its support of international water activities through;

- support for the United Nations and other

Ministry of Energy, Mines and Resources (1986)

multilateral institutions active in international water research, water management and related environmental fields;

- encouragement of international efforts to reduce global environmental degradation;
- provision of training and of humanitarian, economic, scientific and technical assistance to other countries in the management of water quality and quantity; and
- prudent involvement in bilateral agreements that support the exchange of scientific knowledge and expertise and support of Canadian industrial and technological products."

34

Federal Relations in water resources development are determined largely by the political climate of the government controlling the water resources and the potential economic benefits to be gained from water export and international water management issues.

> "Maintaining the quality of the Canadian environment is primarily a domestic responsibility. But we are moving beyond a period of acute, localized, and relatively simple environmental problems to one of chronic, global

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34
Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. 1987. Page 34.

and extremely complex problems in which issues of ecological stability and economic development are closely intertwined. Just as water does not stop flowing at political borders, so pollutants transferred through the atmosphere are not necessarily deposited on their source region. If Canada is to assure and improve its own water resources it must increase its participation in bilateral and multilateral negotiations on environmental standards and controls.... Our image as an environmentally aware people (particularly with regard to water), the legacy of generations of good Canadian water scientists, and the importance of our engineering consulting firms all bolster our international reputation. Recognition of the global nature of many water problems now requires that to meet our own needs we assume even greater responsibility - as leaders in a move to resolve the critical water problems facing almost all parts of the world."

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The state of international relations, with regard to water resources developments seem often to be reflected

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35
Science Council of Canada. Water 2020:
Sustainable Use for the Twenty-first Century.
Ottawa: Government of Canada. 1987. Page 19.

in the state of boundary water relations.

> Within boundary water relations..."Mechanisms for dealing with boundary water disputes (PPWR and IJC in particular) have already been established in Alberta. Certainly the potential for disputes is related to instream uses."

[36]

A respondent from Agriculture Canada, appears to concur with the above assessment..."IJC and Boundary Waters Treaty have served well, but additional pressures from the U.S. are probable."

[37]

> "Over time, the IJC has evolved into an effective institution for helping governments resolve boundary water problems without rancour. The Great Lakes Water Quality Agreement is a good example of the Commission's efforts to improve and protect a shared water resource for the benefits of both Canada and the United States.
>
> The federal government is committed to ensuring that water management actions and activities that affect boundary waters, are consistent with the

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[36] from correspondence with J.D. McTaggart-Cowan
Ottawa: Director, Office of Environmental Affairs
Ministry of Energy, Mines and Resources (1986)

[37] from correspondence with C.W. Lindwall
Lethbridge, Head, Soil Science Section
Research Branch,Agriculture Canada (1986)

principles of the Boundary Waters Treaty of 1909. In meeting its commitment, the federal government will continue to:

- ensure that both nations adhere to the Boundary Waters Treaty when managing boundary water matters;
- regulate development on the Canadian portion of international rivers to ensure that transboundary implications are taken into account;
- consider IJC recommendations on boundary water issues, with a view to ensuring Canadian needs are addressed in a spirit of international co-operation;
- refer international disputes to the agency deemed by both governments to be best suited to handle them, normally, but not exclusively. The IJC; and
- participate with and support that agency to ensure that it has adequate resources, especially if requested to take on additional tasks or major studies."

38

In dealing with the sensitive issues of jurisdiction, as

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38 Environment Canada. Federal Water Policy. Ottawa: Government of Canada. 1987. Page 32.

they relate to boundary water issues, the Manager of Programs for the Ministry of State for Science and Technology offers this interpretation of the legislation:

> "Boundary water issues will fall primarily under Federal jurisdiction for international boundaries and provincial jurisdiction of any provincial boundaries. The management of water in the interior of the province will remain primarily a provincial responsibility, although subject to federal objectives and standards."

39

2.2.7 CONCLUSIONS

Federal agencies involved in water management may be classified into three distinct categories. These categories involve the regulation, development and representation of special interest in water resource management. These roles are essentially inseparable and, therefore, require high levels of interagency interaction to function as a regulator and/or developer in water resource management. Interagency interaction

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[39] From correspondence with R. Lawford, Manager of Programs, Ministry of State for Science & Technology, Ottawa: Government of Canada. (1986).

is especially important to the regulatory function where this regulator should work to achieve the requirements of other agencies rather than attempt to determine its own needs. With this form of multi agency interaction the likelihood of duplication in policy development, research and administration is significantly reduced, and in evaluation of the full range of impacts on other departments, may be assessed. This 'alternative futures approach' may also be interpreted at the jurisdictional level.

> "As pressures on water resources grow, there is an increasingly urgent need to ensure that when Canadians in one jurisdiction use water, they take account of the values gained or foregone in other jurisdictions.
>
> Provinces always have access to courts to resolve water disputes with other provinces or with the federal government, but the implications of legal decisions usually extend beyond the issues at hand and can be detrimental to the future co-operative management of the shared resource. Wishing to avoid binding litigation that could have negative effects for one or all parties, governments may hesitate to initiate water developments in basins of shared jurisdiction.
>
> In the interest of managing shared water resources with a minimum of confrontation, a mechanism is

required to address potential and actual conflicts between jurisdictions. The federal government is prepared to co-operate with the provinces in development such a mechanism.

To this end the federal government proposes:

- that interjurisdictional water resource problems arising from pollution or regulation of waterways be solved, where possible, by agreement between jurisdictions concerned;
- that steps be taken to develop appropriate procedures so that in cases where the jurisdictions involved have tried but failed to reach agreement, and where the issue has become a major concern to one or more of the jurisdictions, those disputes can be referred to mediation or arbitration and;
- to negotiate with the provinces for the development of the mechanism which would allow for the ultimate resolution of interjurisdictional disputes in cases where all other means of reaching agreement have failed."

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Assessing the feasibility of such alternatives, by guaging the political climate through the interpretation of legislation, is discussed in the following section.

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[40] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. (1987). Page 33.

2.3 PRIMARY CONSIDERATIONS RESULTING IN FEDERAL WATER POLICY LEGISLATION

Federal water legislation serves as an indicator of the primary trends in federal water management policy. The degree of provincial government involvement in the federal legislation is a direct indicator of the long-term level of federal-provincial cooperation at the time that the legislation was drafted. The tendency for increasing provincial government involvement in federal government legislation has progressed steadily since the 1960's. The following review of water-related legislation selectively traces federal government strategies in water management.

A respondent from the Fish Habitat Management Branch from the Department of Fisheries and Oceans provides a synopsis of the limitations in working with the Fisheries Act.

> "Canada's Constitution does not mention water, but under any interpretation of it, the provinces have wide jurisdiction over water. The federal government does have responsibilities, however, such as fisheries, which leads some to overlap and interdependence of responsibilities between the provinces and the federal government.

The federal/provincial responsibilities for water and fisheries are even more complicated in Alberta, where the federal government partially withdrew from day to day administration of the fisheries in 1930, thereby allowing the province to occupy this field. It is not constitutionally possible, however, for the federal government to withdraw completely and the Department of Fisheries and Oceans continues to retain legislative responsibility for the proclamation of laws and approval of regulations pertaining to the fisheries.

Even administratively, the situation is not clear because there are a number of so-called discretionary sections of the federal Fisheries Act that cannot be easily administered by the Province. Both levels of government have therefore agreed recently to commence negotiations toward an agreement respecting the formal administrative delegation of certain fisheries responsibilities in the fish habitat field.

It is for fish habitat that the main interface with water resource managers takes place, because the habitat consists of not just the water itself, but its quality as well. As a consequence, there is a residual federal interest in all activities that could affect the chemistry, physics and

> biology of water. In reality, of course, that federal interest is administered by the provincial fisheries agency in Alberta, as explained above. The only issues where the federal authorities would have a more direct involvement would be for transboundary projects involving other jurisdictions outside Alberta, or for federal projects where Ottawa is contributing financial support or owns the land in question."

41

2.3.1 The Fisheries Act (1867) is one of the most long standing pieces of federal legislation in water management. The purpose was to provide protection and conservation of Canadian fisheries. The Act is administered mainly by the Department of Fisheries and Oceans, with Section 33 being placed under the jurisdiction of the Department of Environment.

Sections which apply more directly to fisheries include Section 20 which authorizes the Minister to require the construction, operation and maintenance of fishways, canals or hatcheries to mitigate the effects of dams or other obstructions. Section 31 provides that 'no-one may carry on any undertaking that results in harmful alteration, disruption or destruction of fish habitat

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[41] from correspondence with C.L. Dominy
Ottawa: Chief, Habitat Programs and Freshwater, Fish Habitat Management Branch, Fisheries and Oceans. (1986)

unless approved by the Minister or by regulations under the Act.

In addressing the limitations that Section 31 places upon the development of water resources, the Pearse Inquiry on Federal Water Policy proposed that:

"The Fisheries Act (Section 31) and Regulations should be amended to enable the habitat requirements of fish to be considered within the framework of integrated resource management of water systems. These changes should include the following:

(i) provisions to enable officials of Fisheries and Oceans Canada to formally engage in integrated resource planning and management with provincial, territorial and other federal agencies.

(ii) powers to delegate administrative responsibility for these matters to provincial and territorial agencies in appropriate circumstances.

(iii) arrangements to enable project proponents as well as the Minister of Fisheries and Oceans to call for approval of planned projects, and procedures for applying for approvals and reviewing plans.

(iv) authority for Fisheries and Oceans Canada to approve plans and formally authorize activities carries out according to the approved plans.

(v) where other avenues are not provided, provisions for the Minister of Fisheries and Oceans to hold public hearings at his discretion on development proposals that will affect fish habitat."

42

The response from the provincial government of Alberta was that,

> "Alberta concurs with the Inquiry report's analysis of the Fisheries Act where it recognizes that it is an inflexible piece of legislation, that it presumes Fisheries and Oceans Canada to be pre-eminent in water resources management, and that 'any economic activity within a river basin is constantly in technical violation of the Fisheries Act' regardless of the level of disturbance. It also leaves open the potential for double jeopardy. Alberta's understanding is that Fisheries and Oceans Canada would no longer have a pre-eminent veto position, but would instead be regarded as one of a number of agencies whose responsibilities will have 'to be considered within a more comprehensive

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[42] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change - Final Report: Inquiry on Federal Water Policy. Ottawa: Goverment of Canada. (1985). Page 68.

framework of resource uses and values.' In Alberta, the authority and responsibility for water resource planning and management rests with Alberta Environment. Fisheries concerns, are currently being addressed within the river basin planning and management process in place within the province. Alberta strongly supports the concept...the prairie provinces as a region where the responsibility for fish habitat protection should be delegated 'to other levels of government', specifically the provincial governments. Current discussions between the federal government and Alberta relating to delegation of authority and responsibility should be accelerated.

If the authority for fish habitat protection is to be delegated to the prairie provinces... all approvals would be obtained in advance from the province as is the current procedure. All public hearings, negotiations, etc. would be conducted by the provinces. The current levels of irritation, uncertainty and extra expense would be reduced if federal and provincial duplication in these areas was eliminated." 43

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43 Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy, Edmonton: Alberta Government, (1986) page 2.

Section 33 relates to the deposit of deleterious substances in water. Under Section 33.1(1) the Minister is authorized to require the submission of plans of work that is likely to affect fish habitat. The Minister may require plan modification following consultation with the appropriate provincial and federal agencies. Section 33 (1) and (2) prohibit the deposit of deleterious substances "in water frequented by fish; or in any place or manner where deleterious substances may enter such waters," where such deposition does not conform with the regulations under the Fisheries Act or other federal acts. Section 33(II) defines a deleterious substance to include any substance or water containing a substance, or heated water, that if added to a water-course would be harmful to fish. Regulations do, however, provide exemptions for the deposition of certain deleterious substances of specified concentrations and quantities in specified waters. Such regulations apply to pulp and paper, chlor-alkali; petroleum refining, mining as well as certain food processing industries.

> A further recommendation of the Pearse Inquiry was that the "Administration of the deleterious substances section (Sec. 33(2)) of the Fisheries Act should be based not only on national baseline standards for industrial effluents, but also, and more importantly,

on site-specific controls consistent with the integrated resource management requirements of particular watersheds."[44]

This recommendation did not meet with a favourable response from the provincial government.

"In Federal waters, this recommendation is entirely a federal matter. However, Alberta disagrees with this recommendation and in fact has continually voiced strong opposition to the principles contained in Section 33 as evidenced by Alberta's submission on Bill C-38 "An Act to Amend the Fisheries Act" to the House of Commons Standing Committee on Fisheries and Forestry and so recorded in Minutes and Proceeding Issue No. 33 dated June 16, 1977. This piece of legislation remains an intrusion into provincial jurisdiction and repudiates any acknowledgement of provincial control and water resources management programs moreover, environmental jurisdiction. The provision of Section 33(2) of the Fisheries Act duplicates the water quality management initiatives of Alberta through the provincial

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[44] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -
Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985), page 106.

Clean Water Act. Alberta's view is that this section should be removed from the Fisheries Act leaving the task of setting water quality standards at the watershed level to the provincial governments, subject, of course, to Alberta's position to uphold agreed-upon national standards and guidelines.[45]

"Within the contemporary context of the general priorities in water management by the federal government, several limitations have been identified in the Fisheries Act. Although the Act addresses the regular function of managing the resource, no provision has been made for habitat inventory, planning habitat requirements or development. The lack of recognition in the Fisheries Act of multiple or integrated resource management has resulted in confrontation between federal and provincial agencies in Alberta and other areas of Canada.

The responsibilities for fisheries and navigation were originally vested in the federal government and reflected the national, commercial and subsistence priorities of the 1860's.

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[45] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government, (1986) page 7.

The adoption of an integrated or multiple use approach to fisheries planning and management has been identified as a significant shift in the constitutional setting. Under recommendation from the Pearse Commission, the Fisheries Act could be changed to add provision for the conservation and development of fish habitat through comprehensive management programs in a multiple or integrated water resource context. The provision should be such that the existing prohibitory section of Section 31 would only be applicable in the absence of the new multiple use planning approach.

With this approach to the management of the resource, national effluent standards to control the quality of the fish habitat or water quality would be amended in favour of basing effluent requirements on the regional water quality objectives established for the receiving waters. The assimilative capacities for certain wastes, the sensitivities of native fish populations, and the impact of waste discharges already present, could be incorporated into the regional assessment of the effluent capacity of watercourses.

2.3.2 The Prairie Farm Rehabilitation Act (1935) represented a partial adoption of the multiple use approach to water management at a federal level. The purpose of the Act was to provide federal assistance for the rehabilitation of drought and soil drifting areas in the prairie provinces of Alberta, Saskatchewan and Manitoba. In essence, the intent of the Act is provided in Sections 3 and 4 which are designed to secure rehabilitation of drought and soil drifting areas and promote systems of farm practice, tree culture, water supply, land utilization and land settlement that will afford greater economic security.

> In response to the recommendations of the Pearse Inquiry on Federal Water Policy, the Alberta government disagreed that:
>
> "The provisions in the *Prairie Farm Rehabilitation Act* that relate to water development should be reviewed in light of modern conditions and needs. This review should consider, among other things:
>
> i) The appropriateness of this legislation as a means of providing for agricultural water development projects.
>
> ii) The desirability of the limited geographic application of the Act.
>
> iii) The need for regulations to provide guidance about the interpretation and application of the legislation.
>
> iv) The appropriate scope of activities provided for under the Act."[46]

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[46] P.H. Pearse, F. Betrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada, (1985) page 71.

Alberta disagrees with this recommendation. It is Alberta's position that it continues to be appropriate to have a federal agency in existence whose sole mandate is to assist the prairie provinces with water development and soil conservation issues. This region represents a large geographic area of Canada with unique soil and water supply problems relating to the naturally occurring circumstances of drought, soil erosion and limited surface and subsurface water supply. PFRA, unencumbered by legislated regulations, has been an excellent example of federal flexibility and sensitivity and should be left intact." 47

Under the administration of the Department of Agriculture, the PFRA has established an agency as a water developer/operator in farming communities or municipalities. The Act does not extend to all areas of Canada that experience drought, and deviates somewhat from the federal government's role as regulator in water management.

It has also been noted that the range of programs provided by the PFRA could be provided by traditional federal agencies perhaps with the cooperation of the federal departments of Agriculture, Forestry and

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Alberta Environment, Submission of the
Alberta Government with respect to the Final Report
- Inquiry on Federal Water Policy.
Edmonton: Alberta Government, (1986) page 4.

Environment.

2.3.3 The Atomic Energy Control Act (1953) was enacted to provide the control and supervision of the development, application and use of atomic energy. The Act, therefore, regulates the management of radioactive substances and any other substances employed in the production, use or application of atomic energy.

Under Section 4 of the Act; the Atomic Energy Control Board is comprised of the President of the National Research Council and four other Governor-in-Council appointees. Section 9 authorizes the Board, with the approval of the Governor-in-Council, to make regulations.

(a) for developing, controlling, supervising and licensing the production, application and use of atomic energy.

(b) respecting mining and prospecting for prescribed substances, and

(c) regulating the production, import, export, transportation, refining, possession, ownership, use or sale of prescribed substances and any other things the Board may decide are used for the production or use of atomic energy

The national implication of such regulation is established in Section 17 which declares that all works and undertakings for

(a) the production, use and application of atomic energy

(b) research and investigation respecting atomic energy, and

(c) the production, refining or treatment of prescribed substances works for the general advantage of Canada, and are, therefore, under federal jurisdiction.

Although large areas of Canada are not directly involved in the mining or production of materials employed in the atomic energy industry, all areas could be impacted by disposal of atomic energy wastes. Under the Act, decisions made at a federal level have the potential for extremely long term effects on Alberta water resources.

As the Atomic Energy Control Act has the potential to restrict the mortgaging of the quality of Canada's

2.3.4 future water resources - so the International Rivers Improvement Act has the potential to limit the consequences of Canada's water management strategies beyond it's borders. The International River Improvements Act (1955) is administered by the Department of Environment and provides for the regulation of construction, operation and maintenance of works on international rivers that would alter natural flows and interfere with the use of rivers outside Canada.

The provisions of the Act require that licenses be obtained for any construction, operation and maintenance of international river improvements. Section 6 authorizes the Governor-in-Council to order any international river improvement in violation of the Act or regulations forfeited to Canada and removed, destroyed or otherwise disposed of, with the costs involved being recoverable from the owner. Section 7 exempts projects constructed under a Federal Act, situated within the boundary waters, or built solely for domestic, sanitary, irrigation or other similar consumptive uses. The Act is binding upon the provinces, with the applicability of provincial laws provided that their provisions are not in conflict with the Act.

It is noteworthy that this Act does not address issues of water quality. The exclusion of irrigation works from the provisions of the Act is particularly applicable to Alberta. In the intensively irrigated sections of southern Alberta the natural flow of the Milk River could certainly be altered by further irrigation development and thereby interfere with the downstream use of the river in the United States, unless otherwise administered.

2.3.5 The purpose of the Navigable Waters Protection Act is to protect the navigability of water-courses. Ministerial approval is required under Section 50 of the Act for any construction to be built or placed in, upon, over, under, through or across any navigable waters. Under Sections 19 and 20, 'no person shall throw or deposit or cause, suffer or permit to be thrown or deposited any sawdust, edgings, slabs, bark or like rubbish of any description whatever that is liable to interfere with navigation.....(or)....."any stone, gravel, earth, cinders, ashes or other material or rubbish that is liable to sink to the bottom in any water any part of which is navigable or that flows into any navigable water." The Minister is allowed to designate places where rubble or other materials may be deposited.

The Act provides strong powers to the federal government to protect the navigability of waters in harmony with its constitutional authority.

> The Pearse Inquiry on Federal Water Policy, recommended that:
>
> "The Minister of Transport and the Minister of Justice should accelerate the review of the Navigable Waters Protection Act. Among other things, this review should aim at clarifying the definition of "navigable water" for the purposes of this legislation."

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P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -
Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985) page 71.

> Alberta agreed that the current definition of "navigable water" is vague and was not intended to apply to all waters in Canada. "The following are two alternatives that should be considered: (1) defining "navigable water" as waters that are used for commercial navigation on a regular basis; or (2) defining "navigable water" in Alberta as the Peace River from Peace River town to Fort Vermilion, the Athabasca River from Fort McMurray to Fort Chipewyan, etc. Major lakes could also be considered such as Cold Lake, Lake Athabasca and Lesser Slave Lake. These alternatives should be discussed with the provinces as soon as possible. The current definition results in uncertainty to project proponents on small streams or lakes as to the need to meet this federal act."

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2.3.6 Under the administration of the Ministry of Transport the purpose of the Canada Shipping Act (1970-71-72) was to provide control of pollution from ships and to recover costs and damages from the polluters. The Act provides regulations that prohibit the discharge of specified pollutants from ships. The Act also regulates the removal or destruction of ships in distress that are or are likely to discharge pollutants. The Act also regulates the safety measures in loading and unloading practises, the maintenance of pollutant containment and cleanup equipment, and the safe discharge of emulsion and water ballasts.

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[49] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government, (1986) page 3.

2.3.7 In 1970 the Canada Water Act was enacted under the jurisdiction of the Department of Environment to provide for the management of the water resources of Canada, including research and the planning and implementation of programs relating to the conservation, development and utilization of water resources.

The Act was based on essentially three perceived trends in water resource utilization. These trends included the perceived rapid increase in water demand and the requirement for further research into supply and demand management. Pollution was viewed as a matter of urgent national concern requiring measures be adopted in areas most critically affected. The third perception which contributed to the Canada Water Act was the value of comprehensive programs in cooperation with the provinces for research and planning of water resources to ensure their optimum use.

Provisions under the Act may be divided into four parts; namely:

(i) Comprehensive Water Resource Management
(ii) Water Quality Management

(iii) Nutrients

(iv) General.

Under the provision relating to Comprehensive Water Resource Management, Section 3 authorizes the Minister to enter a variety of consultative, advisory and coordinative arrangements with the provinces on national, regional or river basin bases. The mandate of these programs includes research, project design and implementation of comprehensive inventory and data collection management programs. The federal government is also authorized to act unilaterally in establishing these programs. On occasions when all reasonable efforts to reach federal-provincial agreements have failed; limited authority is provided for direct involvement in inter-provincial boundary and international waters. The preparation of comprehensive management plans is vested in the Governor-in-Council, but the authority for implementation is limited to boundary and international waters. Provisions for federal-provincial cost sharing is also specified in this first section of the Canada Water Act (1970).

Part two of the Act addresses issues of water quality management in determining the nature and quality of current and anticipated wastes; recommended water quality standards and effluent treatment requirements. Under Section 16 water quality management may be concluded on the recommendation of the agency or by joint agreements with the ministers who are party to a federal-provincial agreement. Under Section 11(1), unilateral federal action may be undertaken on interjurisdictional waters of urgent national concern where all reasonable efforts to effect federal-provincial agreements have failed.

Under the recommendation of the Pearse Inquiry on Federal Water Policy;

> "Part 2 of the Canada Water Act should be repealed" and replaced with provisions to authorize the federal government to assist in resolving disputes between provinces and territories about the use of interjurisdictional waters. These new provisions should authorize federal intervention where:
>
> i) The provincial or territorial governments have made reasonable efforts to reach agreement and have failed, and
>
> ii) The federal government receives a complaint from one or more affected jurisdictions.
>
> The legislation should provide that, where these conditions are met, the federal resolution of the problem should be based on the recommendations of a board established for this purpose and on which the affected jurisdictions are represented.
>
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Alberta conditionally supported the intent of this recommendation, provided that it was viewed as an addition to the process of interjurisdictional water management as exemplified by the Master Apportionment Agreement (M.A.A.) and the Prairie Provinces Water Board (P.P.W.B.).

The position of the Alberta government was that;

> "A number of transboundary interjurisdictional water resource problems and issues in the Saskatchewan-Nelson Basin of the prairie provinces have been successfully dealt with under the M.A.A. through the P.P.W.B. Although the Saskatchewan-Nelson Basin is a particularly complex interjurisdictional river basin to manage, the extensive spirit of cooperation of the four parties involved has led repeatedly to the early resolution of problems.
>
> It is Alberta's opinion that this arrangement of a multi-lateral agreement with an administration board could serve as a model for assisting with the management of interjurisdictional river basins in other regions of Canada. The arbitration process proposed by the inquiry team could be a useful addition to the existing dispute resolution process, but it should not be

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P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -
Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985) page 74.

> considered as a replacement to the process of ongoing consultation typical of the affairs of the P.P.W.B.
>
> Alberta feels that, although it may be prudent to provide for a precursor step to the courts, it is equally important to first establish formal transboundary water agreements similar to the M.A.A. among the provinces and the federal government in river basins where necessary. Secondly, a dispute resolution mechanism such as the proposed arbitration board could be adopted, but provision must also be made for the use of the Federal Court as the final authority in an unresolvable dispute. Thirdly, the clearest guarantee for a minimum of disputes is an administration board such as the P.P.W.B. that meets on an ongoing basis. Finally, Alberta concurs that Part 2 of the Canada Water Act should be repealed."

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Part 3 of the Act relates specifically to the regulation of cleaning agents and water conditioners containing nutrients that could enhance nutrient enrichment and

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Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government, (1986) pages 5-6.

eutrophication of the waters.

The fourth and final part of the Act provides for inspectors and analysts in water management as well as authorizing the Minister to appoint advisory committees. Section 22, under part four of the Act, establishes the liability of fines for violators of the regulations specified under Section 18.

2.3.8 The purpose of the Migratory Birds Convention Act was to ratify and implement the Migratory Bird Convention with the United States. The focus of this convention is the protection of migratory game, migratory insectivorous and migratory non-game birds.

2.3.9 Part III of the Government Organization Act (1970) defines the general responsibilities of the Minister of the Environment. Under the provisions of the Act the Minister has jurisdiction over all matters which Parliament has not otherwise assigned and which relate to: weather, renewable resources (including migratory birds), meteorology and the preservation and enhancement of the quality of the natural environment. Duties include the enforcement of International Joint Commission legislation that regulates the preservation and enhancement of the quality of the natural environment.

Legislation is also designed to provide an assessment early in the planning process of new federal projects for any potential adverse effects on the quality of the natural environment. Under Section 6(1) (b) of the Act, the Minister of Environment is obligated to promote practices leading to better preservation and enhancement of the environmental quality and cooperate with the provincial governments on these matters. Section 6 (3) authorizes the Minister, with Governor-in-Council approval, to enter into agreements with the provinces.

2.3.10 In 1976 the Environmental Contaminants Act was enacted under the Departments of Environment and National Health and Welfare. The aim of the Act is to protect human health and the environment from prospective contaminants.

Under the Act the Ministers of both departments are permitted to undertake research and make recommendations on substances suspected of entering the environment and that may constitute a threat to human health and/or to the environment. Sections 3 (6) and (7) encourage cooperation with other federal departments and governments in pursuing effective methods of contaminant management. Under Section 3 (8), agreements with the provinces to conduct investigations on substances suspected to constitute a danger to health and/or the environment, may be concluded.

On occasion that a contaminant poses significant danger, Section 4 permits both Ministers to:

(i) publish notice requiring anyone using the substance, or class thereof, in commercial, manufacturing or processing activities to notify the Minister of the Environment.

(ii) require information on the substance or class thereof, from the user, and

(iii) require importers and manufacturers of the substance or any product containing it to conduct tests specified by the Minister.

Further subsections of Section 4 require manufacturers and importers to register chemical compounds with the above stated departments once their inventory reaches 500 kg.

Section 7(1) is a schedule of chemicals believed to constitute a threat to human health and/or the environment. Release of any of these chemicals in the course of commercial manufacturing process is prohibited under Section 8(1), unless in accordance with Section 18.

Products containing scheduled substances in quantity or concentration greater than the prescribed level are prohibited from import and manufacture.

The Ministers of Environment and National Health and Welfare are required to offer to consult with the provinces and other federal agencies, under Section 5.1, prior to adding a substance to the schedule. The purpose of the consultation is to determine whether the provinces would take appropriate measures to eliminate the perceived danger to human health and the environment.

The Minister of Environment is required to publish proposed orders and regulations so that objections may be filed. In the event of such objections an Environmental Contaminants Board of Review is set up to review the extent of the danger posed by the substance in question. Such consultation processes may be bypassed in times of emergency; although provision is made for objections to such bypasses.

Substances in violation of the regulations of the Act may be seized, retained, returned and/or forfeited.

> Amendments recommended in the Pearse Inquiry on Federal Water Policy propose that;
>
> "The _Environmental Contaminants Act_ should be amended substantially to place the onus on producers, importers and users of toxic substances that fall within certain categories (to be listed in regulations) to seek approval and registration of those substances before they are marketed or used.
>
> The controls on cleaning agents and water conditioners that contain harmful nutrients, now in Part 3 of the _Canada Water Act_, should be integrated into the _Environmental Contaminants Act_

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[52] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -

2.3.11 In 1982, the Constitution Act was passed by the Government of Canada. Under Section 92A of the Act, the provinces are given exclusive jurisdiction over many aspects of non-renewable natural resources.
53

The Constitution Act does not contain direct reference to the water resource. Nevertheless, the provinces exercise proprietary rights over the resources, hence the water, within their borders. Their competence to legislate in water matters derives from their jurisdiction over management of public lands, over property and civil rights and over matters of a local and private nature. Provinces, therefore, have authority to legislate in areas of domestic and industrial water supply, pollution control, non-nuclear, thermal and hydro-electric power development, irrigation and recreation. They have delegated some of this responsibility to local government bodies.

The federal government has proprietary rights regarding federal lands and water in the terrotories, national parks and Indian Reserves.

Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985). page 70.

53

D.R. Percy, "Federal/Provincial Jurisdictional Issues". Water Law in Canada. Ottawa: Government of Canada. (1984). Page 103.

> Parliament has exclusive legislative jurisdiction over commercial navigation, a power that extends over most watercourses of significant size. Parliament has also exclusive legislative jurisdiction over both inland and ocean fisheries, including their protection in the river basins. It shares jurisdiction with the provinces in agriculture and health.
>
> Parliament also has the residual power to legislate for peace, order and good government of the country, regulation of trade and commerce, banking, taxation and public debt, census and statistics, defence and criminal law. Under its declaratory power, parliament may bring into federal jurisdiction a local work declared to be of general advantage to Canada or to two or more provinces.
>
> The federal government is responsible for conducting relations with other countries, an extremely important power in relation to water as so much of Canada's water resources are in boundary water basins."

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The provincial government of Alberta concurred with these proposed amendments.

54
Environment Canada. Federal Water Policy.
Ottawa: Government of Canada. (1987). Page 43.

[55]

2.3.12 CONCLUSIONS

Legislation in the water resources development sector provides a structure for informed decision making and serves as a catalyst for incentives for change. The Task Force on Environment and Economy 1987 has identified that;

> "Regulations are a necessary part of environmental management. As trustees of the environment, governments must act with vigour to protect it. But regulation is only one element of the solution: Canada has a mixed economy, and the market system with its energy and technological creativity must also contribute to the solution. In order to do this, we must develop new tools and techniques for informed decision making.
>
> We must strengthen our data base on resource distribution and environmental quality, and we must share such data more efficiently and more quickly between jurisdictions. We strongly support efforts to develop state of the environment reporting at provincial, territorial and national levels as a

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[55] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy, Edmonton: Alberta Government, (1986) page 10.

primary means of sharing our data and communicating effectively to the public on the use and quality of our resources and environment.

We must further explore and develop methods for the evaluation of resources such as water, soil and forests. We must explore the pricing of these resources and review the practice of discounting future benefits and costs in order to factor the needs of future generations into present development decisions. Pricing mechanisms can be used to insure that costs are equitably distributed, and can induce both public and private sector agencies to adopt efficient and effective pollution control and environmental protection technologies and practices. We must also seek to value environmental amenities such as recreational opportunities and aesthetic opportunities that contribute to quality of life. It is not appropriate to quantify all intangible values in terms of dollars and cents, nor is it appropriate to base all decisions solely on cost benefit analysis. Methods do exist however which can be used to apply economic weights or values to environmental resources, attributes, effects and benefits which are not otherwise bought or sold. We should use these methods where they make sense and where they contribute to fair and equitable decision making.

We must improve our ability to forecast the impact of new kinds of development and new industrial processes and products. Technological innovation can pose threats to the work place and environment, but it can still also be used to enhance work place safety and environmental quality. The development of new processes and techniques which make less use of hazardous materials or control them better must be a priority. Incentives to increase the likelihood of such developments should be put in place. In a new era of economic growth, the development of clean industrial technology will be essential. Clean technology and research and expertise which it requires represents an important component of the growing 'environmental' economic sector.

Informed decision making can be encouraged and demonstrated by practical examples. To indicate new directions by concrete examples, we urge the use of demonstration projects. These can be used to test new concepts or illustrate new methodologies, but most importantly to prove that integrated environmental and economic planning can work effectively. Many such projects already exist and should be given greater recognition. New projects should be developed where opportunities

exist and these should be communicated to the public and shared with other jurisdictions and industries."
56

Federal water legislation serves an an indicator of the primary trends in federal water management policy. To ensure that these federal water management policies are implemented as national water management policies, ongoing federal-provincial consultations must be entered into, in order to address the whole host of interjurisdictional and regional implications in the comprehensive management of Alberta water resources.

Certain structural changes in the management of water resources development programs could be adopted to facilitate ongoing federal-provincial and cooperative, interdepartmental programs. The perceived issues, concerns and resulting priorities in Federal water resources management appear to be fairly clearly identified within each of the Federal Government departments. Significant variation in priorities, however, does exist interdepartmentally. This inconsistency in priorities does pose a considerable limitation to the degree of cooperative programs that

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Canadian Council of Resource & Environment Ministers.
Report of the Task Force on the Environment and Economy.
Ottawa: Government of Canada. (1987). Page 4.

are undertaken between departments within the federal government. With greater stress placed upon consistency in the development of water resources priorities, a greater number of cooperative programs would probably result at the interdepartmental level as a result of the more coordinated and therefore more concerted effort in cooperative program ventures. Greater use of existing structures in cooperative programs at a departmental level in the federal government could probably be translated into the more frequent implementation of federal-provincial programs in the water resources sector.

These alternatives in water resources management strategies will be discussed , in part, in the following section on the role of the provincial government in the management of Alberta water resources. The detailed analysis of the effectiveness and alternative structures in federal-provincial water management programs ,however, is developed in the fourth and final sections of this thesis.

3.0 THE ROLE OF THE PROVINCIAL GOVERNMENT IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

> "No single agency is capable of addressing all the concerns raised with respect to the comprehensive management of Alberta water resources. By their very nature, water resource issues involve, for the most part, more than one province and the federal government. The provincial government of Alberta has the most extensive mandate in the majority of the concerns raised."

57

In a statement to the contrary, the Executive Director of the Alberta Water Resources Commission states that agencies most capable of addressing the full range of concerns raised by these issues of comprehensive water resources management are:

-"Alberta Government as a whole.
-Alberta Environment
-Alberta Agriculture
-Alberta Economic Development

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57 from correspondence with J.D. McTaggart-Cowan Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources (1986)

-Alberta Forestry, Lands and Wildlife
-Alberta Municipal Affairs
and the
-Alberta Water Resources Commission."[58]

From the perspective of an Alberta Forestry respondent the Alberta provincial government agencies that are most capable of addressing the full range of concerns in water resources management, are:

"(1) Alberta Environment - the recognized water manager
(2) The Alberta Forest Service - the land manager (watershed manager) of the Green Area which produces the water
(3) Alberta Research Council - a research agency."[59]

A further observation made by a respondent from Alberta Environment is that:

"None of the water issues will fall exclusively under federal jurisdiction."[60]

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[58] From correspondence with R.H. Cronkhite, Executive Director, Alberta Water Resources Commission. Edmonton: Government of Alberta. (1986).

[59] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry (1986)

"Agencies handling environment, resources, health and agriculture...." were indicated by this respondent from Alberta Environment as being most capable of addressing the full range of concerns raised in the comprehensive management of Alberta water resources.[61]

From the perspective of another respondent from Alberta Environment;
"The federal government has a role in interbasin diversions, boundary water relations and aboriginal rights; the other issues are provincial matters.[62]

In response to the potential that exists for federal-provincial cooperation in the resolution of the abovestated issues; this respondent from

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[60] from correspondence with Dr. C. Ko, Ph.D, P.Geol.
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986)

[61] from correspondence with Dr. C. Ko, Ph.D, P. Geol.
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986)

[62] from correspondence with M.Houston,
Edmonton: Evaluation Engineer, Dam Safety Branch
Alberta Environment. (1986)

Alberta Environment indicated that,

"The above three federal-provincial issues will be very difficult to resolve."

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Furthermore, because "Alberta Environment is responsible for most provincial aspects" in the management of Alberta water resources, it would be the most capable of addressing the full range of concerns raised by these issues of comprehensive water resources management.

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In contrast to the responses from Alberta Environment, the response from a respondent for Alberta Agriculture exemplifies the diversity of the perceptions and needs in addressing the full range of concerns raised by the issues of the comprehensive management of Alberta water resources. The list of desirable cooperating agencies is given as follows:

Federal - Departments of Environment and

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from correspondence with M. Houston,
Edmonton: Evaluation Engineer, Dam Safety Branch
Alberta Environment. (1986)

64

from correspondence with M. Houston
Edmonton: Evaluation Engineer, Dam Safety Branch,
Alberta Environment. (1986)

> Agriculture including PFRA. Various funding agencies, such as CMHC. Indian Affairs should play a supportive role rather than a lead role
>
> Provincial - Department of Environment, Agriculture, Mines and Resources, Inter-Government Affairs.
>
> Private - Ducks Unlimited, Fish and Game and similar organizations. Alberta Irrigation Projects and similar. Industrial groups and producer groups."

[65]

Considerable variation appears to exist, both within and between departments of the provincial government, in the order of priorities for water resources development and the perceived jurisdictional differences over Alberta water resources.

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[65] from correspondence with W.J. Wankel
Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986)

3.1 INTRODUCTION

Water is a valuable resource that is managed to support the economic and social objectives of the Province of Alberta.

> "Water Resources are currently the responsibility of the Provincial Government, with some federal legislation affecting some management areas such as Fisheries, Aboriginal Rights issues, Navigational Waters, and waters within federal lands. U.S. Boundary Agreements obviously involve Canada and United States in respect to international water apportionment. Water Export is considered a non-issue."

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The keystone of water management is to insure that an adequate supply, in quantity and quality, of water is maintained to attain the economic and social objectives of the province throughout all sectors

Research in water management alternatives is

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from correspondence with R.H. Cronkhite
Edmonton: Executive Director
Alberta Water Resources Commission. (1986)

> "No. 1 by current trends. Research is definitely needed in increasing activity for the foreseeable future. Past and current planning has determined the need for broad basin conceptual studies. Research in management options has lagged relative to other areas. Technical answers have to be available prior to planning for it to be effective."
> 67

Water management, in terms of these overall objectives, is founded on the orderly development of water resources.

3.1.1 CURRENT INITIATIVES IN PROVINCIAL GOVERNMENT WATER MANAGEMENT STRATEGIES

> "The public, industry and agriculture will have to become more aware of their impact on water quality and water demand."

67
from correspondence with W.J. Wankel,
Lethbridge: Planning Section Head, Agriculture Centre,
Provincial Government of Alberta. (1986)

[68] Multi-purpose planning has been stated as a principle in the management strategies of water resource development. A basin approach to river management is conducive to orderly development, and has permitted inter and intra provincial allocation of water use.

Evidence of this multi-purpose approach may be seen in the design and implementation of the Agricultural Land Base Study (1988), conducted jointly by the departments of Alberta Agriculture, Alberta Environment, Alberta Forestry, Lands and Wildlife, Alberta Municipal Affairs and Alberta Transportation and Utilities.

> "The terms of reference for the Agricultural Land Base Study presented three provincial goals which provide the rationale for expanding and intensifying the use of provincial resources to increase agricultural production.
>
> These provincial goals include:
>
> 1) To increase the contribution of the renewable resource sector to the provincial economy;
>
> 2) To increase the rate of rural economic

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[68] from correspondence with M. Houston,
Edmonton: Evaluation Engineer, Dam Safety Branch
Alberta Environment. (1986)

development; and

3) To decentralize economic development activity to all regions of the province.

Within the context of these provincial policies and goals, the following five objectives for the Agricultural Land Base Study were defined in the terms of reference:

1) To identify the natural resource management options available for the expansion and intensification of Alberta's agricultural land base;
2) To identify the geographic distribution and the maximum potential increase in the agricultural production achievable through the application of the management options;
3) To assess the relative economics of the management options;
4) To evaluate the impact of such management options on other natural resources; and
5) To identify existing government programs that promote the application of the management options."

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The recommendations following from the Agricultural Land Base Study included an analysis of the impact on other

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Alberta Agriculture, Agricultural Land Base Study. Edmonton: Government of Alberta. (1988). Page 6.

resources. Under the terms of the proposed agricultural development, potential impacts were identified in the following areas:

- fish and wildlife resources;
- timber resources;
- public rangeland resources;
- recreation resources;
- soil resources;
- water resources.[70]

> In addressing the concerns of integrated watershed management, the Pearse Inquiry on Federal Water Policy proposed, "that the federal government should adopt integrated watershed management as a principle of federal water policy."[71]

> In a provincial government response this recommendation was "clearly suitable for waters under federal jurisdiction. Alberta concurs with

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[70] Alberta Agriculture, "Analysis of Impacts on Other Resources," Agricultural Land Base Study, Edmonton: Government of Alberta. (1988). Page iv.

[71] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report,- Inquiry on Federal Water Policy. Ottawa: Government of Canada, (1985) page 97.

> this approach and for some years has practiced it in its river basin planning and management process. Examples include the South Saskatchewan and Cold Lake-Beaver River studies completed in 1984 and 1985 respectively."[72]

> Riverbasin Planning is "absolutely essential - but must recognize the specific land base and social factors associated with the basins."[73]

> Furthermore, Riverbasin Planning is "important as part of interbasin diversion and in support of the socioeconomic value of water."[74]

The Master Agreement on Apportionment permits Alberta to consume half of the water which would, under natural conditions flow into Saskatchewan. Priority in water use and allocation is subject to provincial requirements over interprovincial and national needs, without influence by international considerations, i.e. Alberta will not be party to any undertaking for the possible export of water beyond Canadian borders.

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[72] Alberta Environment, Submission of the Alberta Government respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government, (1986) page 10.

[73] from correspondence with R.H. Cronkhite, Edmonton: Executive Director, Alberta Water Resources Commission. (1986)

[74] from correspondence with G.P. Bergstrom,Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.T. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986)

Although water is considered a free good, in order to be consistent with provincial policy, the costs associated with the supply and distribution of water are to be borne by the local authority with the potential for Alberta Government cost-sharing where direct public benefits are evident.

> In the application of the User-Pay Principle in water supply "Proper payment for costs in developing and delivering water is necessary. Charges for water as a commodity will require considerable evaluation."

75

> A recommendation generated by the Pearse Inquiry on Federal Water Policy was that "The federal government should encourage water conservation and demand management practices by explicitly endorsing the principle that beneficiaries

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75
from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986)

> should pay for water and wastewater services by means of appropriate prices."[76]

The response from the provincial government indicated that;

> "Alberta supports the intent of this recommendation as it relates to water conservation. However, water management tools and strategies like demand management and pricing are the responsibility of the Provincial governments."[77]

Greater awareness of the obligations and responsibilities for more efficient water use is evident, with the recent focus on the rehabilitation of storage and distribution of systems over increasing the amount of irrigated land within the Irrigation Districts. This trend is further developed by the preferred conjunctive use of surface and groundwater resources where suitable. In areas of new irrigation development, developers are encouraged to use existing facilities to further increase the economic viability and efficiency of the supply and distribution system.

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[76] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -
Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985) page 99.

[77] Alberta Environment, Submission of the Alberta Government with
respect to the Final Report - Inquiry on Federal Water Policy,
Edmonton: Alberta Government, (1986) page 11.

In order to ensure the development of an adequate and controlled supply of water, the Government of Alberta is committed to take over and operate a major headwork systems to serve the Irrigation Districts.

> Agricultural water use will "continue to be one of the most important issues."

78

> The Agricultural use of water "Must become increasingly effective and efficient. The Agro-climatic character and alternatives must be taken into account."

79

Sustained agricultural diversification and increased production are the primary objectives in the expansion of irrigation headworks and the rehabilitation of storage and distribution systems.

In other areas, municipal water supply dams,

78

from correspondence with Dr. C. Ko, Ph.D., P.Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986)

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from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986)

hydroelectric facilities, irrigation dams, canals and multi-purpose structures are used to augment and maintain adequate controlled water supply. Where rivers have undergone hydroelectric development, the diversion, use or storage of water for hydroelectric generation must not interfere with the maximum advantageous development of water power and other resources of the river or stream upon which hydroelectric works are located.

> Hydroelectric generation "Should decrease in importance in Alberta. Southern waters are required for agriculture and other prior uses. Hydroelectric power is important in Alberta as it is in the rest of Canada and most other countries because it is clean, ideal for peak fluctuations and is safe. Nevertheless, as water becomes more and more scarce, in southern Alberta particularly, hydro generation must be reduced to those operations which are more compatible with other major uses, principally agriculture. This means elimination of winter generation on the Bow, at least after Christmas.
>
> Electric interconnect grids with B.C. and Manitoba should be expanded to take advantage of hydro in those provinces where water is more plentiful and sites are more efficient."

[80]

In Alberta, conditions in the forest reserves are maintained for optimal water supply through the regulation of timber cutting and other activities. The experimental programs, presently examine the effect of vegetation management practices on the water yield or timing of runoff and have significant potential for further federal-provincial cooperation.

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[80] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986)

Any such undertakings however will ultimately be determined by strategies in Water Demand Management which "Depends on real competition for water uses. Increased demand management will occur as water supplies are being committed to their limits."[81]

Interbasin diversions however will "continue to be at conceptual state."[82]

Despite the fact that "Rural and urban demands may make diversions attractive. Such proposals have already been opposed and it can be expected that opposition will continue."[83]

The uncompromising position of the Alberta government is demonstrated by the provincial government's response to the Pearse Inquiry recommendation that;

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[81] from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986)

[82] from correspondence with Dr. C. Ko, Ph.D., P. Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986)

[83] from correspondence with V.L. Kunce,
Edmonton: Special Projects Officer,
Alberta Public Safety Services. (1986)

"Projects involving transfers of water from one basin to another should be considered only with great caution and only when alternative means of serving the purpose are infeasible. Federal involvement in such projects should be based on comprehensive evaluation of proposals including careful analysis of economic, social and environmental impacts in both donor and receptor basins."

84

"The Alberta government's policy on water management is that the water resources of the province are managed on a river basin basis. The water in each basin must be fully and efficiently utilized before major interbasin transfer will be considered. Planning and management is being concentrated on developing water plans for each of the six major river basins in the province (Peace, Athabasca, North Saskatchewan, Bow, Red Deer, Oldman). None of these river basins has reached full water allocation at this time. No studies are underway which contemplate transferring water from one basin to another."

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[84] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985) Page 102.

85

Under provincial legislation, water supply augmentation through interbasin transfer is only considered once the water supply in the major river basin has been fully and efficiently utilized, yet remains insufficient to meet the demand. Furthermore, the transfer must not jeopardize any foreseeable need in the basin of origin. Any reallocation of waters is normally subject to the principle of prior appropriation as set out in the *Water Resources Act*. Water allocation is undertaken in an orderly manner while minimizing the adverse effects on the present and future use and management of water.

The order of precedence for the reallocation of water is given as follows:

(a) a licence to divert and use water for any or all of the following purposes

(i) domestic use
(ii) municipal use
(iii) irrigation and other agricultural uses
(iv) industrial uses
(v) water power use
(vi) other similar uses

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85 Alberta Environment, Submission of the Alberta Government with respect to the Final Report-Inquiry on Federal Water Policy, Edmonton: Alberta Government (1986).

(b) a licence to impound water for the purpose of water management, flood control erosion control, flow regulation, conservation, recreation or the propagation of fish or wildlife or for any like purpose.

(c) a licence to use water in its natural state for the purpose of conservation, recreation or the propagation of fish and wildlife or for any like purpose

(d) a licence to divert water other than by impoundment or storage, for the purpose of water management, flood control, erosion control or channel realignment or for any like purpose.

Alternatively, in theory, the priority for water use may be summarized in ranking order as follows:

(i) domestic
(ii) municipal
(iii) industrial
(iv) irrigation
(v) water power
(vi) other purposes

In effect, priority in time prevails over this ranking.

The priority ranking of water uses, tends to be an especially political process. Especially,"if the "user-pay" principle is followed, instream resource values for instream users must be similarly priced."[86]

Furthermore, "As part of aboriginal rights, conservation and protection; instream resource values will remain an issue."[87]

Where water rights have been granted by prior appropriation, the terms of the licences may be used to limit one or more of the above stated uses. The government has the right to reserve the use of unallocated waters if such allocation is in the public interest. In the event that water rights are suspended by the Lieutenant Governor under emergency measures, water users are entitled to compensation for losses or damages.

Water rights presently allocated to Irrigation Districts are guaranteed even though, in most cases, final licences have not been issued.

In the allocation of groundwater resources, first priority is granted to domestic users with the requirement that new non-domestic users provide proof that additional development will not cause an unreasonable effect on existing wells.

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[86] from correspondence with R.H. Cronkhite, Edmonton: Executive Director, Alberta Water Resources Commission. (1986)

[87] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of:D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

It should be noted that "Groundwater is generally not a major source of water in Alberta. Political concerns will prevent realization of some projects."
88

"Most small communities and rural homes in Canada use ground water as their source of supply. Generally, ground water has been regarded as free from contamination and requiring minimum treatment before use. However, this assumption is now in question since organic compounds such as trichloroethylene, trichloroethane, chloroform, carbon tetrachloride and benzene have been detected in ground waters at much higher concentrations than those found in surface water supplies, in almost all states in the U.S.A. east of the Mississippi River. Only limited data are available for Canadian ground water supplies, but these indicate that the situation may not be as serious as that in the eastern United States. A few local

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[88] from correspondence with W.J. Wankel,
Lethbridge: Planning Section Head, Agriculture Centre,
Provincial Government of Alberta. (1986).

> problems are known, for example, in Ontario, Nova Scotia and New Brunswick. Since it generally takes ground water sources a long time to purify themselves, contamination problems can be difficult to deal with. Detection of the nature and extent of ground water contamination is often difficult and expensive owing to the costs of drilling monitoring wells."[89]

> Groundwater issues are "Growing in importance. The need exists to build and infill the information base and performance background."[90]

Policies in water management to control water pollution are designed to reduce the possibility of adverse effects on humans, animals and vegetation.

> "There is a concern for adequate water treatment facilities."

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[89] from correspondence with V.C. Armstrong, Ph.D.,
Ottawa: Head Criteria Section, Health Protection Branch,
Health and Welfare Canada. (1986). On behalf of:Honourable J. Epp,
Ottawa: Minister of National Health and Welfare,
Government of Canada. (1986).

[90] from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

[91]

> The Department (of National Health and Welfare) has always recognized the traditional role of the provinces and municipalities regarding the construction, operation and maintenance of water treatment plants. The departmental role can be viewed, however, as a catalytic one, fulfilled mainly through cooperative ventures with the provinces under the aegis of the conference of Deputy Ministers of Health and its Advisory Committee on Environmental and Occupational Health. Matters relating to water supply and quality have consistently occupied a high priority on the agenda of the Advisory Committee....
>
> The Minister of National Health and Welfare has specific powers relating to drinking water, under the Good and Drugs Act. However, the department has chosen not to use the powers conferred by this legislation to control community water supplies because of the traditional arrangements whereby the provinces and municipalities have exercised their own control in such matters. That being said, drinking water has been retained under

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[91] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources
on behalf of:L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

> federal jurisdiction in areas such as national parks, reservations, defence bases, transportation carriers and communities north of 60."

[92]

At the provincial level, the primary strategy is to control pollution at the source, although the assimilative capacity of watercourses is also used as a secondary means of reducing industrial and municipal wastes as long as the receiving waters are able to purify or absorb those wastes without a deterioration in the overall aquatic environment and/or endangering any futures uses.

Such standards include:

(i) Guaranteed water quality for domestic purposes

(ii) Municipal wastes:

(a) 85% - 95% oxygen-demanding water

(b) 85%-95% of suspended solids

(c) additional treatment may be necessary before discharge into a water body

(d) phosphorus control is assessed

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[92] from correspondence with V.C. Armstrong, Ph.D., Ottawa: Head, Criteria Section, Health Protection Branch, Health and Welfare Canada. (1986). on behalf of Honourable J. Epp, Ottawa: Minister of National Health and Welfare, Government of Canada. (1986).

individuallly especially where discharges are into recreation areas

(iii) Industrial Wastes: Management includes responsibility for clean-up costs and any direct costs associated with pollution. No public subsidies are available.

The implementation of these guidelines involves a number of different factors. Industrial waste loadings are determined by a compromise between the Alberta Government's surface water quality objectives and the best practicable technology. The technology in use thus represents the compromise between the availability, effectiveness and economic viability of existing technologies. Alberta's standards are at least those of the Environmental Protection Agency (E.P.A.). Economic viability is overridden where environmental risks are evident. In this manner hazardous wastes are processed to obtain maximum protection of public health and the environment.

> Although major epidemics of typhoid and cholera are a matter of history in Canada, we cannot afford to be complacent about microbial pathogens in drinking water. Giardiasis is emerging as a concern in western Canada. Outbreaks of viral diarrhoea, such as occurred as recently as (April 1986) in Drumheller, Alberta, and occasional outbreaks of typhoid traced to plant failures,

> cross-connections and flooding of wells serve to demonstrate the potential public health significance of organisms that may escape our sanitary barriers. The current emphasis on chemical contaminants in drinking water, therefore, should not divert investment in adequate facilities and research and development for the control of microbial pathogens in drinking water."

[93]

In forest reserves, conditions are maintained that are favourable to providing optimum water quality and for fish habitat, recreation of downstream water supplies.

Having established the context of the current initiatives in the provincial government's water management strategies, the discussion in the following section proceeds to identify and interpret the general priorities, objectives and policies in provincial water management strategies.

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[93] from correspondence with V.C. Armstrong, Ph.D.,
Ottawa: Head, Criteria Section, Health Protection Branch,
Health and Welfare Canada. (1986).On behalf of Honourable J. Epp,
Ottawa: Minister of National Health and Welfare,
Government of Canada. (1986).

3.2 GENERAL PRIORITIES, OBJECTIVES AND POLICIES IN PROVINCIAL WATER MANAGEMENT STRATEGIES

- "Our perception of public reaction is that, more and more, the public is saying that it wishes to be kept informed of and to have a voice in, government activities relating to matters that may affect them."[94]

Issues that are forecast as having the potential to initiate significant change in comprehensive water resources management strategies in the foreseeable future, include:

"- Human Activity & River Basin Planning
- Socio-Economic Values
- Demand management in conjunction with User Pay Principles
- Municipal Waterworks and Waste Treatment and Drinking Water Standards."[95]

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[94] from correspondence with V.L.Kunce,
Edmonton: Special Projects Officer,
Alberta Public Safety Services. (1986).

[95] from correspondence with R.H. Cronkhite
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

In reviewing the policies in place, however, the primary foci of the provincial legislation are enhanced economic and social objectives to be gained from improved water management. Guidelines of general objectives as set out by the Alberta Government, list five items that are particularly relevant to the water management sector. They are:

(i) Diversification of the provincial economy with less reliance on the export of primary energy resources of raw materials.

(ii) Improved quality of life in Alberta

(iii) Balanced regional growth in Alberta

(iv) To ensure that provincial resources are not wasted, damaged or polluted.

(v) Expansion of foreign markets.

96

3.2.1 DIVERSIFICATION

It is noted that a key component in any diversification strategy is the upgrading of Alberta's natural resources, wherever economically feasible.

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[96] Alberta Environment, Inventory of Current Objectives and Policies for Water Management. Edmonton: Government of Alberta. (1982). Pages 16-18.

Agriculture continues to form the base of the economy in Alberta. Introduction of irrigation has allowed a significant increase and diversification of agriculture in the province.

> In comprehensive Alberta water resources management,
>
> "The greatest change may occur in the Provincial Sector where the pressures of water demand from agriculture and industry support water diversion and interbasin diversion such that the Federal Sector would enforce their jurisdiction."

97

The realization of such developments could have diverse and far reaching ramifications in many areas of the Alberta economy. The development of the petrochemical and spin off industries, as well as the hydroelectric power markets which have developed are all highly dependent on a sustainable supply of good quality water. Comprehensive integrated water management strategies can contribute greatly to efforts to attract and expand these industries with a minimal impact on the agricultural sector.

Maintaining strong primary industries is an integral part of diversification since these industries, such as

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from correspondence with F. Kohler, Engineer,
Alberta Recreation and Parks On behalf of D.E. Cline,
Edmonton: Assistant Deputy Minister, Design and Implementation
Division, Alberta Recreation and Parks. (1986).

agriculture, timber and mining (including oil and gas extraction) are the mainstay of the provincial economy and provide the raw materials for upgrading.

3.2.2 QUALITY OF LIFE

> "There are always complaints about Alberta's water during runoff in Spring. However, Alberta water is fairly good and push for standards is not as strong as other areas of Canada (i.e. Ontario)."

[98]

Although the quality of life may be improved through the security of a diversified economy and the securing of foreign markets; water management has the potential to enhance the quality of life through environmental protection, recreation, and community development, fish and wildlife management and historical resource conservation and interpretation.

Selective perceptions on the state of Alberta drinking water standards are that they are "more of a problem elsewhere than in Alberta, nonetheless, Health Authorities here will have to continue to keep abreast of changing conditions."[99]

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[98] from correspondence with G.P. Berghstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Government (1986).

Furthermore drinking water standards "Will continue to come under closer scrutiny and demand higher standards."[100]

Such assessments of the suitability of the water resources appear to reflect upon the intended use and availability of the results. Although the chemical analysis of the water remains an objective process, the use of the results is essentially a subjective decision. This may in part explain why many of the more abstract resource values in water management have not been clearly defined.

One such instance is the assessment of the socioeconomic value of water. "It is a difficult issue to get a handle on. Because of this, this issue is not as significant as some of the other issues."

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[99] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

[100] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks,on behalf of:D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

[101]

> In order to address issues of this nature one is required to focus public concerns and channel research into water management alternatives. "Increased refinement in water management will be necessary in both design implementation and operation."[102]

3.2.3 BALANCED REGIONAL GROWTH

Where the above mentioned perceptual constraints impact upon the quality of life; the physical distribution of water places limitations upon balanced regional growth in the comprehensive management of Alberta water resources.

> "Water is not equitably spread around. The places that have the most water are most often not the places where people are or where the needs are (i.e. agricultural needs)."

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[101] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[102] in correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

[103]

To meet the objective of balanced growth amongst the regions of Alberta with the existing structures, businesses are encouraged to consider locating in areas of lower growth. The continued implementation of this strategy may be determined in part by instream resource values, throughout Alberta.

> Instream Resource Values..."may or may not become a major issue depending on the pressure the environmentalist groups apply to issues such as interbasin transfer."

[104]

Financial assistance is provided to municipalities so that the costs of basic resources (e.g. sewage disposal and water supply) are more equitable regionally, with good quality facilities for tourism, recreation, fish and wildlife management and environmental protection provided in all parts of the province.

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[103] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources
on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[104] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of:L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

3.2.4 RESOURCES DEVELOPMENT

One of the issues that is expected to affect the greatest change in comprehensive water management strategies in Alberta is:

"Public participation in water resource policy."

105

"People are concerned about the destructive effects of water. However, it will not be a major issue in the 80's or 90's. The need for more water will be much more important."

106

As the importance of water as a commodity increase; so does the importance of risk management in the water sector.

Risk Management is "Important, but there are obstacles to overcome."

107

105

from correspondence with V.L. Kunce,
Edmonton: Special Projects Officer,
Alberta Public Safety Services. (1986).

106

from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

107

> "There needs to be some concentrated evaluation of optimum risk factors in dealing with allocation limits for water supplies."

108

Protection and proper management of the resource base in the province ensures social and economic well-being. Resource protection includes the conservation of energy resources in all forms, conservation of prime agricultural land, soil conservation and reclamation, management of environmental, historical and aesthetic resources and management of the water resources on which fish and wildlife rely for survival.

> Especially in the comprehensive management of fish and wildlife resources, the issue of Aboriginal rights has the potential to significantly impact water resources development in Alberta as "The native people will continue to pressure for control of what they consider theirs."

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from correspondence with Dr. C. Ko, Ph.D., P. Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986).

108

from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

109

from correspondence with G.P. Bergstrom, Aboriginal rights will "continue to be respected." 110

Aboriginal rights, however, are "A thorny issue which can be dealt with by legislation not in the courts. The current attempts to solve all problems in the courts will (hopefully) pass, and cooler heads will prevail. In any case, the issues have dragged on for a century already and show no indication of early resolution. This is unfortunate because of continuing uncertainty, particularly in areas of water rights and water resources planning. I have strong thoughts on how this issue should and should not be handled current attempts are largely among the latter." 111

3.2.5 FOREIGN MARKETS DEVELOPMENT

Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[110] from correspondence with Dr. C. Ko, Ph.D., P. Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986).

[111] from correspondence with W.J.Wankel,
Lethbridge: Planning Section Head,
Agriculture Centre .Provincial Government of Alberta.<1986>.

From the perspectives of those professionals cited below, the development of foreign markets, based upon Alberta waters resources, face a very uncertain future.

The economics of water export will prove to be an "important issue for beyond the 1990's." [112]

Although, "Major export not before year 2,000." [113]

The economics of water export will "perhaps never become a reality." [114]

The perceptions and water management strategies developed in response to foreign markets potential would definitely influence any expansion in the agro-industrial sectors and contribute to the further development of new markets that may in turn add to foreign trade outside of the water sector.

Within the mechanisms established by Alberta

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[112] from correspondence with F. Kohler, Engineer,
Alberta Recreation and Parks, on behalf of: D.E. Cline,
Edmonton: Assistant Deputy Minister, Design and Implementation
Division, Alberta Recreation and Parks. (1986).

[113] from correspondence with W.J. Wankel,
Lethbridge: Planning Section Head, Agriculture Centre,
Provincial Government of Alberta. (1986).

[114] from correspondence with Dr. C. Ko, Ph.D., P.Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986).

> Environment, the negotiation and implementation of international trading agreements in the diversion, pricing and sale of water resources, originating in Alberta "should be left with the provincial government."
115

A somewhat different perspective is held by the Executive Director of the Alberta Water Resources Commission.

> In the negotiations and implementation of international trading agreements in the diversion, pricing and sale of water resources, originating in Alberta..."The governments are competent to negotiate. There appears to be no basis currently for such negotiation. In my personal view, there is a lot more involved than negotiating potential sale of water as a commodity. There must be concern that agricultural use of the water exported could be in competition with agricultural production in Alberta."
116

Research in water management alternatives "on a

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[115] from correspondence with Dr. C. Ko, Ph.D., P. Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[116] from correspondence with R.H. Cronkhite, Edmonton: Executive Director, Alberta Water Resources Commission. (1986).

joint basis (Federal/Provincial) may become increasingly important, considering diversion and export."[117]

3.2.6 INTERNATIONAL RELATIONS DEVELOPMENT

In boundary water relations "Quality concerns will continue, one or two joint projects may develop within a decade"..."mechanisms in place are functioning well. Adjustments would have to be made preceding any consideration of water export."[118]

Within the purview of boundary water relations, "International as well as interprovincial relations will become an increasingly important issue as the demand for water goes up."[119]

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[117] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

[118] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

[119] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources,

> As associated with this increase in water demand, one can reasonably expect greater interest in the economics of water export. "The increasing demands to move water from the north to the south will ultimately be settled as an economic issue."[120]

Apart from the economics of water export, the short and long term quality of Alberta water resources are of major concern to both the Federal and Provincial levels of government.

In addressing one of the foremost issues in the international water sector, a recommendation of the Pearse Inquiry on Federal Water Policy proposed that:

> "The federal government should vigorously pursue efforts to control acid rain by:
>
> (i) pressing forward its arrangements with provinces to achieve the targeted reduction in acid-causing emissions by Canadian industry;
>
> (ii) using all its available influence to induce

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on behalf of:L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[120] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

the government of the United States to substantially reduce airborne pollutants that are transported into Canada;

(iii) support multinational research on global atmospheric pollution and efforts to establish international cooperation in controlling it."

121

The Provincial Government of Alberta interpretted this recommendation "to be directed to the provinces when deposition rates exceed agreed-upon target loadings. Within this context, Alberta supports the intent of the recommendation. Alberta, in conjunction with the other western provinces, is currently funding research to establish target loadings for western Candada. Based upon available information, deposition rates in Alberta are consistently below the interim target loadings.

This province will continue its involvement in the Long Range Transport of Air Pollution Program, and agrees on the need to address this issue on a regional, national, continental and global basis."

121

P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985). Page 110

122

These broadly-based policies are used to set the current context for the present provincial water management strategies in Alberta. Following from this discussion of the general priorities, objectives and policies is the indepth indentification of the more specific, primary considerations that have resulted in provincial water management objectives, policies and programs.

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[122] Alberta Environment, Submission of the Alberta Government with Respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. ([illegible]). Page 9.

3.3 PRIMARY CONSIDERATIONS RESULTING IN PROVINCIAL WATER MANAGEMENT OBJECTIVES, POLICIES AND PROGRAMS

From the general economic and social objectives that have been presented in the form of policies, recommendations and perspectives; specific sectors may be identified within which explicit goals may be achieved through water management.

Concerns arising over the socioeconomic value of water "Will place greater public demands and value on protecting and using our water resources."
123

Well planned, adequate and ongoing research into water management alternatives is fundamental in achieving any range of constantly changing economic and social objectives in comprehensive water management. "Government and industry seem satisfied with their present alternatives. Unfortunately, until demand far exceeds supply, serious research will not go ahead."
124

123

from correspondence with F. Kohler, Engineer,
Alberta Recreation and Parks, on behalf of: D.E. Cline,
Edmonton: Assistant Deputy Minister, Design and Implementation
Division, Alberta Recreation and Parks. (1986)

124

Within the province, five basic policies have been outlined to ensure that a supply of good quality water is not a limiting factor in development. These policies may be summarized as follows:

(i) careful use of water resources with minimum waste

(ii) a practical and equitable sharing of costs providing public availability to adequate water supply

(iii) maintenance of a controlled water supply to reduce the adverse impact of seasonal water supply variations

(iv) orderly allocation of water rights in order to ensure minimum interference with present and future water use patterns

(v) pollution controls to minimize the adverse effect on humans, animals and vegetation.

These core policies are implemented in eight different developmental sectors within the province: The sectors are given as:

(i) community development objectives

(ii) industrial development objectives

(iii) agricultural development objectives

(iv) energy development objectives

Alberta Forest Service, Alberta Energy and Natural Resources,

[illegible]

(v) tourism development objectives
(vi) fish management objectives
(vii) wildlife management objectives
(viii) environmental and historical resource management objectives

[125]

The effectiveness with which the five core policies may be implemented, varies considerably between sectors. These developmental sectors are, therefore, evaluated individually.

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[125] Alberta Environment, Inventory of Current Objectives and Policies for Water Management. Edmonton: Government of Alberta, (1982). Pages 25-53.

3.3.1 COMMUNITY DEVELOPMENT

> "The public will want a say in what is going on. Already significant pressure is being felt for public participation. The public want to be involved in the decision making process."

126

The primary focus in community development is to ensure that communities have opportunities to develop economically and improve their quality of life, with special attention given to the less developed areas of the province and while safeguarding the advantages of living in the rural areas. The purpose is to eliminate the economic erosion and population decline that can occur in these areas.

Services supplied to individual communities have a definite impact on the continued growth and prosperity of the communities.

Municipal waterworks and wastewater treatment "pressure will be increased proportionally with increase of water demand."

126

From correspondence with G.P. Bergstrom. Head, Watershed Management Section, Forest Land Use Branch Alberta Forestry. On behalf of [illegible], Assistant Deputy Minister, Resource Evaluation and Planning Branch. Edmonton: Government of Alberta. [illegible]

[127]

The municipal sector should experience substantial change, particularly in the area of increased costs for water if it becomes a resource which will start to cost money."

[128]

Under a recommendation resulting from the Pearse Inquiry into Federal Water Policy; "The federal government should have the Economic Council of Canada undertake a thorough study of appropriate pricing for municipal water and wastewater services in Canada. This study should:

i) be undertaken in consultation with provincial governments and water utilities;

ii) take account of experience with water pricing systems in other countries;

iii) estimate the economic benefits of appropriate pricing, taking account of its social impacts and implications for regional development;

iv) make recommendations for implementing

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[127] from correspondence with Dr. C. Ko, Ph.D., P. Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[128] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of L.J. Cooke, Edmonton: Assistant Deputy Minister,

> suitable pricing systems in Canada including the practicability of universal metering."[129]

In responding to the recommendation, the provincial government of Alberta indicated that the;

> "Establishment of a committee to review water and sewage treatment pricing practices is a good concept. This committee should consist of a combination of a set of experts from each province and the Economic Council of Canada. It is Alberta's view that the collective experience of the provinces should be used in evaluating and recommending water pricing systems in Canada."[130]

The above mentioned community development objectives have been addressed through short and long term provincial water management programs. Three of the long term programs are as follows:

(i) The irrigation of water waste has been addressed through the "Regional Water and

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[129] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985). Page 104.

[130] Alberta [illegible] of the Alberta Government [illegible] to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 12.

Sewer Program", which, through consolidation of the water and/or sewage services for a number of communities, can result in more efficient and higher quality delivery of those services. The "Program for Rehabilitation of Deteriorating Water Management Projects" is also helping communities make more efficient use of available water supplies.

(ii) The province wide cost-sharing programs for water supply and sewage treatment facilities are in place:

(a) The Alberta Municipal Water Supply and Sewage Treatment Program.

This program provides grants (under certain circumstances) which equalize the costs that municipalities must bear for sewage and water services.

(b) Regional Water and Sewer Systems Program.

This program assists communities in cooperative efforts to provide centralized water and sewer facilities.

(iii) There are a number of programs directed at removing or mitigating the adverse effects of variations in water supply to communities. Long term programs address:

(a) Cost Sharing programs for water supply and sewage systems. (e.g.) Red Deer Regional Water

(b) compensation programs for water well problems (e.g.) Waterwell Recovery Program for seismic or oil and gas drilling related activities. Short term programs in provincial water management address a significantly different range of issues. These issues include:

(c) emergency water supply strategies for domestic water use, i.e. Emergency Water Program.

(iv) To ensure that community water supplies are protected in three ways from interference caused by other uses of water.

(a) the quality and quantity of water supplies for domestic use are guaranteed by the government and every effort is made to ensure that all the communities have sufficient water supply for other use.

(b) domestic users have first priority in groundwater use.

(c) domestic and municipal uses are ranked first and second in the priorities for reallocation of water and the allocation of water during a shortage.

(v) To provide that care is taken to ensure that community water supplies do not become contaminated by pollution. Pollution control orders have been issued to stop contamination of sources of water supply and ongoing efforts are made to improve the construction and operating of sanitary landfills to reduce the chances of pollutants entering ground or surface water.

In addressing the needs from programs in Community Development; the recommendation of the Pearse Inquiry on Federal Water Policy was that:

"The federal government should consult with provincial governments and their municipal water utilities to determine the most appropriate means of improving and financing construction and improvement of municipal water, wastewater and stormwater infrastructure."[131]

The Provincial Government of Alberta supported this recommendation, provided that such assistance programs as the Community Services Program continue, it is Alberta's position that these federal funds should be routed through the provincial governments.

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[131] P.H. Pearse, F. Bertrand, J.W. Maclaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 103.

Further with regards to operator training, the federal government has played a role in developing educational materials. It is Alberta's view that the federal government should continue to coordinate provincial input with the result that high quality training material will be produced which would be acceptable to both levels of government.

Finally, there is a need for a control mechanism for products used in water and wastewater treatment. It is assumed that this would be done at the federal level."
132

Within community development, the perceived pressure for further development in municipal waterworks and wastewater treatment will be in response to "Increased pressure to protect the environment and provide safe palatable water."
133

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[132] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 7.

[133] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of:D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

3.3.2 INDUSTRIAL DEVELOPMENT

A respondent for the Resource Evaluation and Planning Division of Alberta Forestry has indicated that industrial water use and "The amount of water being allocated for industrial use is relatively small and is likely to remain so in the foreseeable future."
[134]

In order to demonstrate the range of perspectives held by professionals within the water resources management sector the following forecast of industrial water use was presented by a respondent for the Design and Implementation Division of Alberta Recreation and Parks. Industrial water use "is an ever increasing issue and will rank with agriculture in the management of water demand."
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[134] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[135] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks on behalf of:D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

The primary focus is to encourage development of processing and manufacturing industries that are efficient, internationally competitive and will upgrade Alberta's natural resources within the province. Potential exists for industrial development in the upgrade of industries involved in agricultural produce, natural gas for petrochemicals and agricultural processing. Industrial development is encouraged where it contributes to strengthening of economic viability of the rural community.

> Industrial water use "Quantities should be available in the managed flows and supplies to allow allocation of water to industrial use of value to the region and in the drainage basin. Industry should continue to be responsible for its own facilities to otherwise store or manage its supply requirements."

136

> Although better use of available water supplies is encouraged, no specific programs for working directly with industry have been established.
>
> "The Department (of National Health and Welfare)

136
from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

> has encouraged "self-regulation" within this industry by working closely with the Canadian Water Quality Association, to which 95% of water treatment device manufacturers belong, in devising a code of practice with respect to device performance and advertising. Indications are that this approach is having only limited success."[137]

No direct subsidies are provided to industries for water management. Adequate and controlled water supply are primary requirements in maintaining most industrial operations. This has been illustrated by the public initiatives to assure water supply for industry, e.g. Dickson Dam for Red Deer River industrial uses such as assistance to municipalities in the form of cost sharing programs for water and sewage treatment and support for development of serviced industrial land and is essential in providing the infrastructure for attracting future development. The planning and construction of the Oldman Dam project appears to have focussed public attention on the fine line that divides environmental conservation and the construction of water resources management structures for long-term agricultural and industrial economics gains.

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[137] from correspondence with V.C. Armstrong, Ph. D.,
Ottawa: Head, Criteria Section, Health Protection Branch,
Health and Welfare Canada. (1986),on behalf of: Honourable J. Epp,
Ottawa: Minister of National Health and Welfare.
Government of Canada. (1986).

In a comprehensive strategy for needs assessment, riverbasin planning is "Becoming a more meaningful tool for developing long-term water management policy."[138]

In Riverbasin Planning "The pressure to plan will continue. Riverbasin planning will continue to ensure optimum use of the water onsite and downstream."[139]

In meeting these objectives a respondent for Alberta Public Safety Services observes that, "In many cases river basin planning could best be left to muni~~cipa~~l and provincial governments."[140]

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[138] from correspondence with Dr. C. Ko, Ph.D., P.Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[139] from correspondence with Dr. C. Ko, Ph.D., P. Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[140] from correspondence with V.L. Kunce, Edmonton: Special Projects Officer, Alberta Public Safety Services. (1986).

In this manner care is taken that the use and management of water for industrial uses need not be unduly inconvenienced with adequate alternative future planning, assessment and public involvement. Through such assistance programs industrial water users are protected from pollution that could adversely affect their operations. (e.g. tertiary sewage installation by the City of Calgary to reduce phosphorous levels to prevent increased algal growth from clogging industrial water intake valves).

In a similar fashion other uses of water are protected from industrial pollution. In the event that these measures are circumvented, polluters must generally pay clean-up costs, plus costs arising directly from the pollution.

> Those stringent measures would generally be introduced in response to greater water demand, with greater demands upon a limited water resource, water demand management "will continue as a top issue for both agricultural and industrial use."

141

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[141] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

3.3.3 AGRICULTURAL DEVELOPMENT

> "There will always be the cry of millions of starving people around the world. The urge to conserve the agricultural land base will continue."[142]

The major objectives in agricultural development that could significantly influence strategies in water management may be given as:

(i) an improved farm economy;
(ii) the greater viability of rural communities;
(iii) the greater stability and security of the farm economy;
(iv) increased agricultural production through the greater productive capability of agricultural land;
(v) increased opportunities for family farm development;
(vi) the creation of secondary agricultural industries;

Through realizing some or all of these major objectives; objectives specific to water management may be influenced.

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[142] From correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

In the impact analysis that was conducted as part of the Agricultural Land Base Study (1988), the major impact on water resources resulting from the proposed agricultural development was identified as the effects of soil erosion on water quality in rivers and lakes.

> "The clearing and cultivation of wooded and native grasslands would lead to significant increases in soil erosion rates in four of the agricultural options (green area conversion, range improvement and prairie range and woodland conversion). Increase sedimentation and possible water quality deterioration could be expected in much of northern and central Alberta with major impacts concentrated in the Peace, Athabasca and Beaver River basins. In these basins, substantial deterioration in fish habitat, municipal water supply, recreational use and the aesthetic value of the area's rivers and lakes could be expected.
>
> The other major impact associated with clearing and cultivation of forested land is the change in run-off volumes and timing which occur after clearing. These changes produce higher flows, often resulting in erosion in previously stable streams, they may also produce flashier run-off with higher flood peaks and reduced low flows. The drainage of wetlands is also a major concern both in terms of lost wildlife habitat, and the loss of

beneficial attenuation of flooding and low flows by wetland storage.

The expansion of irrigated land in southern Alberta raises a different set of concerns for water resources, the primary one being the effects on river quality of withdrawing large volumes of water for irrigation and returning salt laden effluence. The combination of two development alternatives: Irrigation Expansion and the Saline Soil Reclamation; has the potential to produce serious effects on water quality in the Bow and Oldman Rivers. These alternatives produce a number of water quality impacts which may be difficult to mitigate. Low flows related to irrigation withdrawals are currently being experienced and can only be mitigated by the construction of additional storage reservoirs. Water quality concerns related to salt loading can be reduced by maintaining river flows at sufficiently high levels to dilute effluence or by creating salt sinks where drainage water can be collected. In both cases maintaining flows high enough to minimize impacts and to provide sufficient irrigation waters may be difficult and would likely be one of the major concerns associated with irrigation expansion.

Some of the other impacts of the agricultural development on water resources can be alleviated

> through comprehensive planning before development takes place. The off-farm drainage and erosion impacts can be alleviated with effective planning and design of drainage networks to provide sufficient outlet for flood flows, and to include erosion control measures such as culvert chokes, drop structures and bank stabilization. These measures also reduce the water quality impacts of sediment and nutrient loading since sediment levels are directly related to erosion rates, and nutrients such as phosphorous and nitrogen are bound to the sediments and transported with them. The maintenance of buffers can also aid mitigation of impacts."[143]

Further development of drainage and irrigation would be possible where the land is suitable and adequate water supply is available. The primary focus of drainage programs is to improve the productivity of suitable agricultural land by controlling and reclaiming saline or water logged lands and minimizing the effects of erosion.

In addressing the issue of drainage potential of agricultural lands in Alberta, an integrated study has recently been jointly conducted by the Alberta Government departments of Agriculture, Environment, Forestry, Lands and Wildlife, and the Alberta Water Resources Commission. The major recommendations following from the "Drainage Potential in Alberta: An Integrated Study (1987)" were that:

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[143] Alberta Agriculture, Analysis of Impacts on Other Resources: Agricultural Land Base Study. Edmonton: Government of Alberta. (1988). Pages 181-182.

(i) The government should improve drainage in interdepartmental water management plans for each major river basin. These would include technically sound long-range designs, cost effective drainage development and natural resource conservation.

(ii) It recommended that existing program funding be provided to drainage only after adequate integrated planning has been completed.

(iii) During the sub-basin planning process a detailed assessment of the potential drainage benefits and wildlife habitat losses should be included. If habitat is regionally important and drainage benefits are worthwhile, then public funding for appropriate levels of habitat mitigation should be provided for in the drainage process.

(iv) It is recommended that funding be provided for development and testing of drainage techniques which reduce downstream impacts and provide for wildlife habitat mitigation. These techniques would include controlled or choked drainage and on-farm and regional consolidation. When the practicality of such techniques is proven, the government should provide or re-direct incentives for their implementation.

(v) When drainage costs are high because of the need for significant erosion control, downstream damage protection or extensive networks to drain a few isolated wetlands; then standard off-farm drainage methods should be considered not viable. In these instances, and when the agricultural potential warrants, drainage alternatives such as consolidation should be considered for public funding.

(vi) Funding should be provided for research on the classification, drainage, agronomic development and crop production potential of bog and fen wetlands.

(vii) It is recommended that the drainage potential and associated salinity problems of the southern portion of the province receive further study."

[144]

With the impending implementation of these expensive programs, the User-Pay Principle in water supply is "difficult to apply and will continue to be an issue, but is likely to be deferred, at least in agriculture."

[145]

A differing perspective is that the 'user pay principle' in water management is one of the issues that is escalating rapidly in significance. "Right now, people only pay for the processing and distribution of water. The water itself has no value attached. This will change as people start to pay for the water itself."

[146]

Direct ramifications that are expected to result from any such developments in the water sector would be the implementation of strategies designed to manage "The demand for water, particularly from the agricultural perspective. How these demands will be met will become of primary concern."

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[144] Water Resources Commission, Drainage Potential in Alberta: An Integrated Study. Edmonton: Government of Alberta. (1987). Page v-vi.

[145] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

[146] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

147

The limitations imposed by water because of poorly drained land are reduced through:

(i) Cost sharing with local authorities for drainage projects.

(ii) Control of seepage from unlined canals.

(iii) The farm Water Management Program which provides technical advice to farmers on drainage.

(iv) Irrigation, Drainage and Reclamation Program which provides technical assistance for high water table and salinity problems caused by Irrigation District Works.

— In a forecast of agricultural water development; agriculture water use "Will continue in importance but is losing ground."

148

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[147] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[148] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

3.3.4 IRRIGATION DEVELOPMENT

> The agricultural sector should probably expect the biggest change in terms of an expanded land base due to increased irrigation."

149

> In agricultural water use the "concentration on water use by the Irrigation Districts is important since it's the major provincial water user."

150

Irrigation is an important way of meeting agricultural development objectives, especially in southern Alberta.

> Interbasin diversions will be developed "In support of irrigation requirements." and public participation in water resource policy "Will result from interbasin diversion and the demands of industry and agriculture."

151

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[149] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section,
Forest Land Use Branch, Alberta Forest Service,
Alberta Energy and Natural Resources, on behalf of:
L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[150] from correspondence with D. Roberts, Calgary: Project Manager,
Acres International Ltd. (1986).

[151] from correspondence with F. Kohler, Engineer,
Alberta Recreation and Parks, on behalf of: D.E. Cline,
Edmonton: Assistant Deputy Minister, Design and Implementation

Three key strategies are employed in achieving increased irrigation acreage served by Irrigation Districts. These strategies are the intensification, extension and expansion of irrigation works.

(i) Intensification provides increased irrigated acreage without additional expenditures for district works, beyond the provision of new irrigation gates.

(ii) Extensions of the irrigation works provide increased irrigated acreage by providing new minor ditches(1-2 miles long), plus irrigation gates to serve new areas up to 1,000 acres.

(iii) Expansion of the irrigation works provides increased irrigated acreage by providing works to serve new areas in excess of 1,000 acres. Employing these three strategies recognizes and serves to enforce that irrigation development must be economically viable to eventually establish Irrigation Districts as truly self managing units.

In the management of the Irrigation

Division, Alberta Recreation and Parks. (1986).

Districts four strategies have been adopted to improve the efficiency of use. The four strategies include:

(i) Standards established by the Irrigation Council to gauge the suitability of land for irrigation.

(ii) A feasibility report to ensure soil and topographic suitability for irrigated agriculture.

(iii) Rehabilitation of existing canals by Irrigation Districts before any increase in irrigated acreage is sanctioned.

(iv) The provision of adequate technical advice concerning management techniques, (e.g. scheduling, economics and the application of irrigation technology) to all irrigation farmers.

With improved efficiency, the effectivenes of all programs conducted in the Irrigation Districts are enhanced.

Concern was raised, when the Pearse Inquiry on Federal Water Policy recommended that "The federal government should participate in irrigation and drainage programs only under cost-sharing agreements that are available to all provinces on a consistent basis. To qualify for federal support, projects should:

i) be in the form of off-farm, collective or community works;

ii) be subjected to comprehensive evaluation to determine all their effects in the watershed and to demonstrate that their benefits exceed costs according to benefit-cost analyses appropriate for water-related projects;

iii) provide for charges to the direct beneficiaries that reflect the cost of providing them with the benefits they receive."

[152]

The response from the Provincial Government of Alberta was that "Alberta queries the wisdom of this recommendation because it insufficiently recognizes the varying physical, social and economic circumstances between regions. Agricultural development through irrigation and drainage projects can be of particular significance to the welfare of a region and its people.

The Inquiry report gives little recognition to the

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[152] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985).Page 105.

> higher investment and production costs associated with irrigation. Further, it underestimates the need to provide some increased opportunity for financial gain as an incentive for producers to make associated on-farm investment when suggesting irrigation water charges should equal the enhanced value of crops produced.
>
> Irrigation development has been particularly effective in stimulating ongoing economic benefits and forms an important element in Alberta's objective of economic diversification."

153

Three programs for financial assistance are currently in place and play an important role in water management for irrigation purposes.

(i) Under the Headworks Program the Government of Alberta is committed to take over all major headworks for Irrigation Districts and pay 100 percent of construction, operating and maintenance costs.

(ii) The Government of Alberta pays 86 percent of construction and rehabilitation costs of canals and other works within the Irrigation Districts. Irrigation Districts

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[153] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 12.

are responsible for raising the remaining 14 per cent.

(iii) There is a heavy commitment to provide water management facilities that will reduce the adverse effects of seasonal and year-to-year variations in water supply for irrigation.

The development and management of Irrigation systems in the Irrigation Districts has and remains a highly political process in a sector of the province in which water is a scarce and valuable resource.

As a result, management of agricultural water use in the form of "Irrigation in the south will remain a top priority issue."

154

Limitations in water supply have been reduced by minimizing the conflict with other uses and management strategies.

The availability of water for irrigation purposes was further increased in 1975 when irrigation was moved from

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[154] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

fourth to third ranking in the provincially determined priorities for the reallocation of water supplies. In certain instances, the allocation of water rights are reserved in order to ensure the availability of water supplies for irrigation purposes in the future. (e.g. Bow and Oldman River Basins.) In this manner the issues of water quality have been addressed by the provincial government of Alberta. The issues of water quality in managing irrigation development appear to be somewhat more elusive.

> "The issue of groundwater and its contamination is relatively new. However, it is fast becoming a major concern, particularly in the United States. It will become an important issue of the eighties."

155

> Groundwater issues, "There will be increased demand to protect groundwater resources, especially the quality aspect."

156

> Groundwater Issues "Of protection from pollution and fair use will continue."

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[155] from correspondence with G.P. Bergstrom,
Head, Watershed Management Section, Forest Land Use Branch,
Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of: L.J. Cooke, Edmonton: Assistant Deputy Minister,
Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[156] from correspondence with Dr. C. Ko, Ph.D., P.Geol.,
Edmonton: Section Head, Resource Evaluation,
Hydrogeology Branch, Alberta Environment. (1986).

[157] In other water quality concerns over certain surface water bodies some measures include - the enhancement of *Agricultural Chemicals Act* and administration of the Confinement Livestock Facilities Waste Management Code of Practice sets a guideline for the location, construction and operation of feedlots, in an effort to control pollution from agricultural operations.

Measures taken to protect agricultural water users from quality problems include such measures as the installation of tertiary sewage treatment by the City of Calgary to reduce phosphorous levels which contribute to increased algae which is responsible for clogging irrigation intakes and reducing flow of water in irrigation canals. The long term role and extent of irrigation in the provincial management of Alberta water resources would appear to be highly speculative. The economic, social, environmental and political components of operating irrigation systems cannot be overlooked in assessing the future of this water management tool.

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[157] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

3.3.5 ENERGY DEVELOPMENT

> Hydroelectric generation is "Limited in Alberta at this time to the Bow River and North Saskatchewan River systems. This is important for "peak power" efficiency, although it is not expected to increase in those rivers in conflict with other uses."

158

> Furthermore, hydroelectric generation will continue to be assigned a "low priority unless economy rebounds and expands significantly."

159

The primary focus is to ensure the long term adequacy of energy supply for Alberta's needs and to conserve energy resources. The Alberta Government's controls on water pollution for energy development ensures environmental conservation in energy resource exploration, development and transportation. This may, at times, conflict with

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[158] from correspondence with R.H. Cronkhite, Edmonton: Executive Director, Alberta Water Resources Commission. (1986).

[159] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

the objective to ensure that energy is provided at rates which are equitable and reasonable for both the customers of and investors in energy supply.

In the development of hydro and other forms of electric energy, efforts have been made to ensure that water for energy development is used carefully and without waste. These include:

(i) the required installation of cooling ponds at some thermal power plants, thus increasing the amount of recycled water used for cooling.

(ii) that the operation of each hydro facilities must not interfere with the maximum advantageous development of water power. This may, at times, conflict with the objective to ensure that energy is provided at rates which are equitable and reasonable for both the customer and investors in energy supply. In the development of hydro and other forms of electric energy, efforts have been made to ensure that water for energy development is used carefully and without waste and that electric development proceeds in the most beneficial manner possible.

[160]

One limitation has been the fact that, generally, no cost sharing is provided for water management pertaining to energy projects.In energy resource development water represents either the raw material or the medium for cooling and steam generation. "Development is an important consideration because the planning and future development of hydro plants will provide long-term economic benefits to Albertans."[161]

Three measures that have been adopted to minimize a conflict between water use in energy development and other uses, include:

(i) that the apportionment of the flow of certain rivers be allocated to energy development to allow the development or further expansion of hydroelectric facilities.

(ii) New reservoirs are not to be developed if they conflict with existing reservoirs which serve hydro-power generating stations.

(iii) Pollution Control be conducted to ensure coherance to water quality requirements for hydro and thermal power generation.

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[160] Alberta Environment, Inventory of Current Objectives and Policies for Water Management. Edmonton: Government of Alberta. (1982). Pages 41 and 42.

[161] From correspondence with D. Roberts, Calgary: Project Manager Acres International Limited. (1986).

The management of water resources in the development of Alberta's energy sector involves considerable ongoing consultation between several agencies in both the private and public sectors.

> "Despite its (hydroelectric generation) attractiveness, it can be expected that special interest groups will continue to oppose (development). They may be joined by downstream residents of such projects."

162

3.3.6 TOURISM DEVELOPMENT

The primary objective in the policy of the provincial government is to develop tourism so that it contributes to balanced regional growth and the diversification of the economy. Three strategies are employed to meet these objectives.

The first strategy is to establish Alberta as a year round tourist destination. The second is the development and improvement of physical facilities,

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[162] from correspondence with V.L. Kunce, Edmonton: Special Projects Officer, Alberta Public Safety Services. (1986).

attractions and events. The third, and final, strategy is tourism development is the development of opportunities outside of urban and mountain areas.
To this end water management strategies ensure that water is not a limiting factor in meeting tourism objectives. These strategies are included in the objectives listed under recreation, fish and wildlife and environmental protection.

3.3.7 RECREATION DEVELOPMENT

> "Recreation is a social value necessary to a wide cross-section of the public, but is weighed differently by many people. Multi-purpose management should accommodate the valued recreation reasonably."

[163]

The primary focus in recreation development is the orderly development of recreational activities and facilities for the people of Alberta which complement the geological, cultural and ecological characteristics of the province.

Recreation demand will increase with "Popularity

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[163] In correspondence with R.H. Cronk[illegible]te,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

increasing with population. Compatibility with other users can increase with research and trial attempts."
164

Policies designed to accomplish these objectives involve numerous strategies. Some of these strategies include:

(i) The most efficient use of water resources for recreation. This is presently accomplished by attempting to accommodate multi purpose storage reservoirs with water control structures for flow regulation.

(ii) The Government of Alberta is prepared to share the cost of water-based recreational projects with local authorities where public benefits are to be gained (including the regulation of water supplies for recreational purposes)

(iii) Efforts are made to mitigate the adverse effects of variations in water supply or water quality for recreational purposes.

(iv) Efforts are made to ensure that interference with the beneficial use and management of water resources for

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[164] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

recreation, is minimized.

(v) Efforts to ensure that water quality is not a limiting factor in recreational development include:

(a) tertiary treatment in Calgary

(b) tertiary treatment in Kananaskis

165

With the concentration of population in the southern half of the province, the potential for recreation development on many of Alberta's water bodies remains an untapped resource. Potential for significant federal-provincial cooperation exists in this recreation sector for development in the future decades.

> Recreation "will continue to make demands on water resources and use will be considered as a natural right - recreation will co-habitate."

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[165] Alberta Environment. Inventory of Current Objectives and Policies for Alberta Water Management. Edmonton: Government of Alberta. (1982). Page 43.

[166] from correspondence with F. Kohler, Engineer, Alberta Recreation and Parks, on behalf of: D.E. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

3.3.8 FISH MANAGEMENT DEVELOPMENT

The primary objectives in fish management are to ensure that fisheries populations are protected from severe decline and, that viable populations are maintained along with the capability of surface waters for continued fish production. These objectives are designed to maintain an optimum level and distribution of fish resources for recreational, commercial and domestic fishing. Efforts are also being conducted to maintain all naturally reproducing fish populations, and to expand fish resources into presently vacant, but suitable aquatic habitat. The implementation of these objectives are accomplished, in part, by the following policies and procedures.

(i) Indirect means are employed to maximize use of available water supplies for fish management. These include pollution control guidelines for land-based activities such as timber hauling, oil and gas drilling, and the use of controlled livestock crossings with fenced water courses. (e.g. Stauffer Creek).

(ii) Practical and equitable cost sharing arrangements may be made with local authorities for the construction of fish management projects from which public benefits may be realized.

(iii) The management of water resources for irrigation, municipal and other water users, involves the manipulation of water supplies and is an important tool for fisheries management.

(iv) Two measures have been adopted to minimize the conflicts that have arisen in the allocation of water for fisheries and other uses.

(a) Under the Water Resource Act, licenses may be issued for the use of "water in its natural state for the propagation of fish or any like purpose."

(b) (ii) Applications for other uses of water which could negatively affect fish habitat are referred to the Fish and Wildlife Division of the Department of Forestry Lands and Wildlife for review and the emplacement of appropriate conditions or permits and licenses to protect fish habitat.

(v) Fisheries habitat guidelines and measures are in place to protect streambanks from deterioration that may result from livestock grazing and designed to control water pollution. The fisheries development potential of Alberta's water resources has still to be fully assessed. Any development in this sector could potentially involve a great deal of federal government involvement, under the federal Fisheries Act. In the past, fisheries development has been conducted in exclusion of any federal government involvement.[167]

3.3.9 WILDLIFE MANAGEMENT DEVELOPMENT

The present focus is to ensure that wildlife populations are protected from severe decline and that viable populations are maintained. Several water management policies have been adopted in light of these objectives. They include:

(i) Better use of water resources in developing waterlands.

(ii) Cost sharing is available for wildlife projects sponsored by local authorities.

(iii) Adequate and Controlled Water Supply is achieved through specific arrangements e.g. Ducks Unlimited has licenses to stabilize and improve water levels in lakes, ponds and marshes which aid in reducing or mitigating the adverse effects of variations in water supply.

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[167] Alberta Environment, Inventory of Current Objectives and Policies for Water Management. Alberta: Government of Alberta. (1982). Pages 47-51.

(iv) Where issues over the allocation of water quantities arise; any interference with wildlife management is addressed to the Fish and Wildlife Division in the Department of Forestry, Lands and Wildlife.

(v) The pollution control programs are in place to protect wildlife from the adverse effects of pollution.

(iii) Adequate and controlled supply of water is assured by the guidelines in which minimum flows have been established to provide adequate flows.

(iv) Specific water management policies and procedures have been generated to address the following issues as they relate to the allocation of water quantity.

(a) Withholding lands adjacent to significant water bodies

(b) Minimum flow management.

(c) Preserving visual, quantity and eco characteristics of systems.

(d) Watershed management receives first priority in eastern slopes management strategies.

(v) Pollution control is conducted with the implementation of two key strategies. These two key strategies in pollution control are:

(a) The management of hazardous waters to maximum protection of the environment for the management for optimum water quality for fish, recreation and downstream water supplies.

(b) The adoption of effluent standards, no less stringent than the standards adopted nationally in Canada or by the E.P.A. in the U.S.A.

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168 Alberta Environment, Inventory of Current Objective Policies for Water Management. Edmonton: Government of Alberta. (1982). Pages 51-53.

3.3.10 ENVIRONMENTAL AND HISTORICAL RESOURCE DEVELOPMENT

The objectives in environmental and historical resource development are to promote a desirable balance between economic development and environmental protection. In doing so, the provincial government endeavours to minimize the irreversible environmental disturbances, and impact upon historical resources by environmental impact assessment, and historical resource impact assessment.

In assessing the socioeconomic value of water the "Public at large has been generally more interested and to some degree, more affected in recent years. This issue recognizes people's reaction to their increased awareness. Information transfer, hopefully, will improve in the direction of more accuracy and less sensationalism."[169]

In aiding the assessment of the socioeconomic value of water, public participation in water resource policy is "Already happening in limited way. Better mechanisms likely will be found to expedite the process which I believe is a good feature and

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[169] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

I expect will continue to be more influential in the future."
[170]

The management of renewable resources is a long-term priority in resource management. Non-renewable resource development is encouraged if it is not in conflict with this goal. Eastern slope management is basically a multi-purpose approach with watershed management given first priority. The provinces forests provide a viable timber industry, as well as a high quality forest environment.

These objectives have been implemented in policy by which public lands affected by or adjacent to significant water bodies are generally withheld from development and frequently reserved for use as recreation, fish and wildlife conservation, watershed protection and prevention of erosion.

In addition, minimum flows have been established for dams, weirs and other water control diversion structures to provide reliable flows of water within the rivers affected by those structures.
[171]

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[170] from correspondence with W.J. Wenkel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

[171] Alberta Environment. Inventories of Current Objectives and

Cost sharing structures are not widely employed in achieving these objectives. No programs are available for environmental management through water management programs. Project proponents are responsible for funding of historical resource studies.

3.3.11 CONCLUSIONS

> In the resolution of comprehensive water management issues, federal-provincial "cooperation is imperative on most of the issues if water is to be managed in an effective manner. The water management issue is integral to Albertans and it affects the way Albertans live as well as what it costs them in the form of taxes. This will become even more significant when water production costs are assessed to the people."

172

The perceptions gathered about the state of programs, concerns and priorities in the development of Alberta water resources indicate that potential for cooperation

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Policies for Water Management. Edmonton: Government of Alberta (1982). Pages 53-57.

[172] from correspondence with G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources, on behalf of: L.J. Cooke, Edmonton:Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

exists at all levels of government. Significant variation in the priorities associated with water resources development exist both within and between departments at the provincial levels of government.

As identified in the selected quotations in the preamble and throughout this section, noteworthy difference in priorities relating to the development of Alberta water resources appear to exist between such agencies as Alberta Environment, Alberta Forestry and the Alberta Water Resources Commission. Such discrepancies pose serious limitations to the potential for interdepartmental cooperative programs in the water resources sector.

Establishing a non-legislative body with a mandate to promote consistency in water resources priorities and management strategies at all levels of provincial and municipal government could vastly increase the potential for further cooperative, interdepartmental programs in water resources development. Such programs could be developed at the provincial and federal-provincial levels. An increased number of cooperative programs, operating at the provincial and municipal levels would probably facilitate a greater number of federal-provincial programs in the water resources development sector.

In support of further development in cooperative programs, strategies in the comprehensive management of Alberta water resources suggest that, "No one agency

could be expected to have such a capability. It would seem reasonable to expect most issues to be resolved at the appropriate political level with involvement from all interested parties."
[173]

The preamble to the discussion of the application of Federal-Provincial programs in the management of Alberta water resources has been set. Drawing upon references to and interpretations from previous discussions of the Federal and Provincial governments' water management policy strategies, the discussion in the following section focuses upon the application of Federal-Provincial programs in the management of Alberta water resources.

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[173] from correspondence with V.L. Kunce, Edmonton: Special Projects Officer, Alberta Public Safety Services. (1986).

4.0 THE APPLICATION OF FEDERAL-PROVINCIAL PROGRAMS IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

> "Since water should be considered as a national resource, federal-provincial programs should ensure that benefits and responsibilities are shared by Canada as a whole.".

[174]

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[174] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch Agriculture Canada. (1986).

4.1 INTRODUCTION

One of the primary recommendations to improve the effective application of Federal-Provincial Programs in the Management of Alberta water resources relates to a clarification of jurisdictions.

"We would recommend clarification of jurisdictional issues related to water rights. Amendments may not be required if the jurisdictions of each agency are clearly stated."

[175]

From the office of Environmental Affairs in the Ministry of Energy, Mines and Resources, the jurisdictional boundaries in management are defined as follows:

"Province (exclusively): municipal waterworks and wastewater treatment.

Province (mainly): drinking water standards, water export (tanker), public participation, aboriginal

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[175] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

rights, riverbasin planning, groundwater, agriculture, user-pay practice, resource values, riverbasin planning, industrial use, hydroelectric.
Federal (mainly): drinking water guidelines, water export (diversion) user-pay principle, large scale diversions consideration.
Federal (exclusively): boundary waters with U.S."
[176]

The focus is perceptively different in the response provided by a respondent from the Department of External Affairs:

"Very few issues will fall under exclusive federal and provincial jurisdiction, however the provinces will work closely with the federal government and other provincial governments in developing policy and regulations. The provincial governments will have prime responsibility in regulating and controlling most areas concerned with pollution control and waste treatment, while the federal governments will develop policy."
[177]

An interpretation of the existing legislation by a respondent for Agriculture Canada, reflects that

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[176] from correspondence with J.D. McTaggart-Cowan,
Ottawa, Director, Office of Environmental Affairs,
Ministry of Energy, Mines and Resources. (1986).

[177] from correspondence with J. Carson,
Ottawa: Respondent, Department of External Affairs. (1986).

"recreation will probably be exclusively a provincial concern, but most others will be a joint responsibility. Water management is generally considered a provincial jurisdiction until it crosses borders."

178

At the provincial level of government, a respondent from the Agriculture Sector indicated that the issues of comprehensive water resources management in Alberta should not be "handled exclusively by one level of government or another. Joint cooperation should be the key with common benefit the thrust,

e.g. Hydro-electric generation will not be a problem in Alberta when (if) electric generation is handled as a Western Canadian, rather than a provincial enterprise. There can be no such thing as "exclusive jurisdiction" in a federal political system such as we have in Canada in this day and age, where people are inter-dependent on an international scale. On international issues, the Federal Government is clearly mandated to carry the lead role. To do this effectively, they must solicit initially, inputs and subsequently, merit the support of affected provinces.

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[178] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 174.

> On interprovincial issues, the Federal Government should play a more low key mediative role, funding according to the national interest. For example, if Canada wishes to maintain a "cheap food policy" and "regional development" she must be willing to fund a share of agriculture stabilization schemes such as irrigation in Alberta."

179

Such variety in perceptions in strategies reflect the range of interpretations of various pieces of legislation that have the potential to set definite tones in the levels of cooperation that can be expected in the ongoing management of Alberta water resources.

> A further challenge to the comprehensive management of Alberta water resources revolves about the regional nature of many water management issues.
>
> "Regional disputes over water resources present a difficult challenge to management. At base, they reflect geographical differences in the distribution of supply in relation to population and activity. Environmental limits, however, are relative rather than absolute, except for the effect of extreme conditions at certain times and for certain places. The crux of the issues under

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[179] from correspondence with W.J. Wankel,
Lethbridge: Planning Section Head, Agriculture Centre,
Provincial Government of Alberta. (1986).

discussion is how the multiplying demands on major western rivers may be reconciled and adjusted to resource potentials. It involves hard choices and trade-offs among competing uses and values, and comes down to a question of policies and institutions rather than technical knowledge and its application.

The key point for note in focussing this kind of discussion is that traditional policies of water development underlie emerging institutional issues, including inter-jurisdictional coordination. In other words, there are two areas of concern:

> The first covers prevailing strategies of river basin management which are common to all jurisdictions; and
>
> The secone involves the regional division of ownership and responsibility for water resources, i.e. a particular variant of what has been called the structural crisis of Canadian federalism.

Both policy and institutional issues and the relationship between them require brief specification in management terms."

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[180] B. Sadler, "North to the Arctic and East of the Bay", Water Policy for Western Canada: Issues of the Eighties, Calgary: University of Calgary. 1982. Page 9.

In assessing the policy and institutional issues and the relationship between them, in the implementation of federal provincial programs in water management; six primary areas in the water resources development sector have been identified as:

(i) Diversification in Water Management
(ii) Quality of Life
(iii) Balanced Regional Growth
(iv) Resources Development
(v) Foreign Markets Development
(vi) International Relations Developments.

An assessment of the degree of application of federal-provincial programs in the management of Alberta water resources within each of these specific sectors provides a synopsis of the structural crisis of Canadian federalism in water management, as inferred by Sadler.(1983)

Potential for significant change does appear to exist with the implementation of the terms of the Federal Water Policy (1987). Under the conditions of this policy:

> "A joint and co-operative management approach with the provinces is sought by the federal government since, under the Constitution Act, the provinces exercise direct control over many aspects of water

management. The federal government intends to work with the provinces and territories to encourage the provision of safe and sufficient water supplies for Canadians in areas of federal and shared jurisdiction. The Federal Water Policy demonstrates leadership by its commitment to developing and applying the concept of "a fair value for water". In doing so, the federal government will respect provincial jurisdiction and international obligations, and proceed in a manner that furthers social and political goals and contributes to regional development".[181]

4.1.1 DIVERSIFICATION

The concept of diversification in comprehensive water resource planning has been in place in federal policy in the form of the *Canada Water Act* since 1970. Federal-provincial cooperation had previously been limited to engineering programs, benefit cost analyses and financial contributions to flood control structures as under the *Canada Water Assistance Act* (1953).

The multi-purpose planning and management concept was tailored to address problems of conservation and apportionment to sustain balanced economic and social development.

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[181] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. (1987). Page 3.

As stated in the preamble of the Canada Water Act:

"the Parliament of Canada is desirous, that comprehensive programs be undertaken in cooperation with the provincial governments, in relation to water resources for research and planning....and for their conservation, development and utilization to ensure their optimum use for the benefit of all Canadians."

The mechanism of the Act provides the responsible Minister with the authority to enter into agreements with provinces, to formulate comprehensive water resource management strategies where national interest may be served.

One factor in the diversification of water resources management that has traditionally had a particularly low profile has been public participation in the development of water resource policy.

This state of affairs may in part be explained by the assessment of an Agriculture Canada respondent in which " - the public is generally disinterested, unless major problems arise."

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In a complementary observation forwarded by a

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[182] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

respondent for the Office of Environmental Affairs, Ministry of Energy, Mines and Resources:

> "Policy formulation exists at many levels. Albertans will undoubtedly want to be consulted over issues involving pricing and river basin planning."

183

In practice, individual river basins are identified by federal-provincial review for single purpose or multi purpose joint comprehensive basin management. Where formal agreements have been concluded, jointfederal-provincial supervisory boards have been established to manage the programs and administer the 50:50 cost sharing agreements. Canada Water Act planning agreements are restricted almost entirely to inter jurisdictional rivers basins, rivers important to salmon, or river systems in the territories (i.e. water courses where the federal government has some jurisdiction over water).

Although the federal government has been a strong proponent of multi purpose planning - individual provinces have preferred concentrating on single issue approaches to water management. Programs conducted under the Act are intended to address water quality,

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[183] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

flow regulation, environmental impact assessment and mitigation in addition to the multiple purpose planning programs.

Implementation of planning study recommendations and programs has occurred in several ways. Funding arrangements have in some cases involved several agencies. In these circumstances, the administration of funding may be coordinated by a single agency. In the past such funding was administered through the Department of Regional Economic Expansion which is currently undergoing reorganization. Certain programs have been implemented without a formal federal-provincial agreement, while other programs have been more appropriately implemented entirely at a provincial level.

In the partial implementation of the Canada Water Act; the Inland Waters Directorate has been deemed very conservative in its judgement of issues constituting significant national concern. Federal participation in water resource planning programs has been limited to situations where the federal government has a clear jurisdictional role respecting water. Federal participation has been notably limited in programs relating to regional economic development and public health. These issues have been addressed to some extent by the federal government's renewed participation in establishing a set of national drinking water quality guidelines through the Canadian Council of Resource and Environment Ministers.

> Potential does exist for federal-provincial cooperation in the resolution of these issues related to comprehensive water resource management: "Indeed the uses are such that no one level of government can hope to contain all of the expertise and authority to solve any of the water related issues."

184

Alberta is currently reviewing its stance of non-participation in the federal Flood Damage Reduction Program. Alberta's population and economic investments have, for the most part, been located along its major watercourses, many in flood-prone river valleys.

> Riverbasin Planning, "particularly in flood plains, is a concern for both municipal and provincial governments. Opposition to flood plain development may harden as post flood disaster costs escalate."

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In addition to providing emergency flood fighting and

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[184] from correspondence with R. Prach,
Edmonton: Respondent, Canadian Wilflife Service,
Environment Canada. (1986).

[185] from correspondence with V.L. Kunce,
Edmonton: Special Projects Officer,
Alberta Public Safety Services. (1986).

evacuation assistance, the federal government has provided financial disaster relief to help restore flood damaged homes and public facilities. The policies are designed to assist provincial governments when costs exceed what a provincial government could reasonably be expected to pay.

The basic objective of the program has been to discourage development on flood-prone lands and subsequent claims for disaster assistance. As an alternative to constructing expansive structural flood control works; a 50:50 cost sharing agreement has been concluded to provide a mapping and designation of flood prone areas with the floodways identified. The exercise also involved an examination of all cost effective, practical structural and non structural alternatives with minimum environmental impact. Under the General Agreements, provincial assistance programs may be applied to areas outside of the floodways, but within the flood prone areas, as long as the structures were adequately flood proofed. This form of assistance could be of significant value because in the Alberta context,

> Risk Management is "important but politically sensitive. There will likely be extensive delays in any real attempts to address this issue."
> [186]

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[186] from correspondence with W.J. Wenkel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

The Interdepartmental Committee on Water was integral in gaining the cooperation of the numerous federal agencies and influential in program development within flood prone areas. Under the General Agreements, development assistance programs would not be available for undertakings within flood risk areas as classified under the federal-provincial Flood Damage Reduction Program. Such limitations would therefore apply to the Regional Incentive Development Act and National Housing Act. Further disincentive for development is the fact that the federal disaster financial assistance programs would not apply to damages incurred against new structures built in the designated areas.

In designated areas where flood damage reduction measures are required, the Flood Damage Reduction Program includes provisions for additional federal-provincial agreements respecting studies that involve flood forecasting and warning systems; flood-proofing techniques, land use planning; works to control water levels and flows; and the acquisition of property to reduce flood damage potential.

Under the federal program, provinces commit themselves not to engage in or assist in new undertakings that would be vulnerable to damages in areas that become designated as flood-risk areas. Provinces also agree to encourage land use zoning appropriate to flood-risk areas.

In addressing the concerns over Flood Damage Reduction, the Pearse Inquiry on Federal Water Policy recommended that..."Federal activities related to floods should be confined to:

(i) compiling hydrological data about flooding and flood risk;

(ii) constructing flood control works where federal interests are threatened or where damages are likely to be of national significance;

(iii) providing emergency and disaster relief."
187

The response from the Provincial government of Alberta was that "Alberta supports this recommendation and is currently assessing the merits of entering into a Flood Damage Reduction Agreement with the federal government."
188

General Agreements Respecting Flood Damage Reduction and Flood Risk Mapping have been signed with all provinces

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[187] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 106.

[188] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 13.

except Alberta, British Columbia, Prince Edward Island and the Yukon. Concerns exist that an inequitable situation may result where federal disaster relief and other programs are available throughout these provinces while being restricted in the seven other provinces.

> An observation made by a respondent for Agriculture Canada suggests that Risk Management would therefore likely be subject to "differences of opinion as to whether individual users or governments should be responsible."
[189]

In Alberta, the rapid development of low lying areas in the Bow River Valley in Calgary is creating the potential for heavy losses despite provincial flood-risk mapping programs. This development gives credance to the federal government's overtures to initiate federal flood-risk mapping in order to realize a reduction of the disaster-assistance claims and to ensure equitable policy implementation across Canada. Should the program be carried through to provincial and municipal levels to include land use restrictions in flood-prone areas; reduced flood damage, and more inexpensive control works would be accompanied by a reduction to the rate at which prime agricultural land is converted to urban development.

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[189] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

There is significant potential for serious impact upon certain water management programs as a result of differing cost sharing formulae. To avoid these conflicts, all federal water planning programs should adopt the same cost sharing formulae, but allow different levels of funding. Provincial governments should be privy to the federal policies and priorities given to these programs. Greater provincial input in developing the policies and priorities, at a federal level, would provide significantly great potential for federal provincial cooperation at the program implementation level.

4.1.2 QUALITY OF LIFE

> "The need for urgent action to maintain the health of our water system is already directly evident to Canadians. Shortages of fresh water and pollution threaten the quality of life of many Canadians, and the quality of drinking water is a problem in several parts of the country."[190]

"Demand for water in the southern prairies and the

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[190] A.H. Laycock. "The Amount of Canadian Water Distribution." Canadian Aquatic Resources. Ottawa: Government of Canada. (1987). Pages 13-42.

> interior of British Columbia already approaches the limits of supply and shortages in dry years are increasingly common".[191]

The quality of life in both the urban and rural setting is affected directly by the quantity, quality and management of the water resources.

Water management research in the federal sector has been plagued by several fundamental problems. As noted in the Nielsen Report:

> "The problems with R and D in Water Management Research are as follows:
>
> A) There is no clear mechanism for overall priority setting for water management research;
>
> B) There is no clear agreement among managers and scientists on how best to meet demands for water management research; and
>
> C) Program Managers have not adopted or applied appropriate criteria for evaluating projects or research proposals.
>
> The problems with defining Water Management Research should be viewed along with the broader problems of maintaining and effectively using science, which in D.O.E. are not primarily

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[191] Science Council of Canada. Water 2020:Sustainable Use for the 21st Century. Ottawa : Government of Canada. (1988).Page 11.

problems of resources; they concern the following:

> A) Attitude, departmental structure, awareness leadership, acceptance of forward-looking responsibility and communication at the senior level; and
>
> B) The focus of our present science on supporting present policies, leaving little to provide a basis for science on which to develop new policies."[192]

In addressing some of these problems, under the recommendations of the Nielsen Report; a Federal-Provincial Committee was proposed in order to focus water management research priorities at the federal level.

> "The study team recommends to the Task Force that the government consider the following measures:
>
> A Water Management Research Committee (WMRC) be established in conjunction with a
>
> framework of Water Management priorities established by CCREM, that would be responsible for recommending research activities for Water Management Research. The WMRC would be made up of Scientists and

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[192] Nielsen, E. Improved program delivery: Environment. A study team report to the Task Force on Program Review. Ottawa: Government of Canada. (1985). p 270.

> knowledgable people from a cross-section of disciplines and government/industry sectors. It would be responsible for developing criteria for establishing Water Management Research. The Committee should report to the Assistant Deputy Minister of the Environmental Conservation Service."[193]

A similar proposal was filed by the Pearse Inquiry, in which:

> "The Minister of the Environment should be empowered to appoint a Canadian Water Resources Research Council with terms of reference that direct it to:
>
> i) provide up-to-date assessments of the current and emerging needs of water-related research in Canada;
>
> ii) assess the adequacy of financial and other support for water-related research;
>
> iii) offer advice on research priorities and the appropriate distribution of federal research centres, universities, provinces and the private sector;
>
> iv) investigate other policy questions related to water research that it considers

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[193] Nielsen, E. Improved Program Delivery: Environment, Study Team Report to the Task Force on Program Review. Ottawa: Government of Canada. (1985) p 274.

appropriate or that the Minister may refer to it;

v) report annually to the Minister and issue reports on special subjects as appropriate."[194]

In respect to this recommendation, following from the Pearse Inquiry on Federal Water Policy, the Provincial government of Alberta agreed "that the proposed Council membership should represent users, researchers and managers in the federal and provincial governments, the universities and the private sector. There is already an initiative through CCREM to facilitate the intergovernmental coordination of environmental research and it is Alberta's view that it should be the prime initiative.

The recommendation is welcomed providing that the proposed Canadian Water Resources Research Council will embrace the objectives of the Associate Committee on Hydrology of the National Research Council. It must, however, have the authority to grant funds for priority research subjects and projects, if it is to have a meaningful role.

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[194] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 117.

> Merely offering advice and recommendations is not sufficient. Some research priorities must go beyond pure research through addressing subjects and projects that will enhance the standing of Canadian practitioners in the water field (i.e. support for technologies that can be exported)."

[195]

The objective of the Water Quantity Management Data program within Environment Canada is designed to collect, process, analyze, store, interpret and provide complete and meaningful hydrometric data on Canadian waters. Data collection on streamflow, water level and sediment is collected in cooperation with the provinces to aid in the conservation, development and use of Canadian water resources for the greatest social and economic benefit to Canadians of both present and future generations.

A national water quantity survey network was established by the federal government in January of 1975 incorporating a databank in operation since 1880. The role played by the federal government in the construction of each gauging station was determined by the degree to which federal, federal-provincial or provincial interests, were being served. One exception to the provincial government's operation of these gauging stations is found in Quebec. Data gathered through this national survey network is used by a variety of federal, provincial and industrial concerns in flood flow forecasting and reservoir regulations planning and operation of hydro-electric facilities. Apart from applications in irrigation, navigation, industrial and municipal works, the survey may also be used as a basis for determining apportionment between provinces, amongst licensees, and to fulfil the conditions of federal-provincial agreements and international obligation.

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[195] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 16.

> Under the recommendation of the Pearse Inquiry on Federal Water Policy, "The Treasury Board should revise its policies relating to the commercial use of governmental laboratories and equipment to facilitate their use by outside researchers."

[196]

> The Provincial government of Alberta has indicated that it "would be supportive of federal funds being directed to this area since it supports the development of meaningful national standards."

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[196] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985) .Page 117.

[197] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 16.

Furthermore, the recommendation that, "The federal government should maintain a continuing commitment to the Water Survey of Canada and hasten negotiations with provinces and territories to extend the water quality monitoring program nationally." was received favourably by the Province of Alberta.[198]

> "Alberta continues to support the Water Survey of Canada and is actively negotiating a federal-provincial water quality monitoring cost-sharing agreement."[199]

Under the terms of the survey, the federal government pays the full cost of the stations serving solely federal interests, and fifty percent of the costs incurred in stations that have federal-provincial priorities. The remaining stations are financed mainly through provincial coffers, with some private sector contributions.

Those stations that have the following four priorities in their operations are deemed federal stations. Such stations include:

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[198] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 122.

[199] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 17.

(i) those that are required under statutory obligations or support programs of various federal agencies which include specific federal works, studies or investigations, research projects, navigational requirements and management responsibilities

(ii) Those required to define a national inventory of surface waters including information on trends in major drainage basins, total surface water resources and sufficient discharges to the oceans.

(iii) Those monitoring water flowing across or that forms part of the provincial or territorial boundaries and where federal responsibility has been established by agreement or is justified by an inter-jurisdictional concern.

(iv) Monitoring streams that cross or form part of the international boundaries for which there are federal government responsibilities arising from treaties, agreements, studies or International Joint Commission orders.

In contrast, federal-provincial stations have priorities whereby both governments have stated a need for the information and/or where joint responsibility is established under federal-provincial agreement. Under such agreements an assessment of the quantity of water is available in distinct hydrologic zones within the province.

Provincial stations address the priorities of specific provincial programs, including municipal and non-government interests.

The existing network of stations number just over 3,000 in Canada. Strictly, federal interests are served by 38% of these stations. Federal-provincial and provincial priorities are served by 29 and 33 per cent of the network respectively. As specified under the water quantity surveys for federal provincial cost-sharing agreements, 3 percent of the stations submit data on sediment transport. Seventy-five percent of the network costs were covered by federal funds.

> Under recommendation from the Pearse Inquiry on Federal Water Policy; "Environment Canada should review the data distribution policies of its various services with a view toward implementing consistent cost-recovery charges for data provided on request to clients who are not parties to intergovernmental data agreements."

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[200] P.H. Pearse, F. Bertrand, J.W. MacLaren,

The provincial Government of Alberta responded to the recommendation by stating "Since Alberta is a party to two agreements and is negotiating a third with Environment Canada, it is not likely to be faced with cost-recovery charges for data published in standard form. However, it is evident that Environment Canada would like to recover costs for data provided on a real-time basis (i.e. for the cost of transmitting those data).

It would be appropriate to levy charges for data provided to parties outside intergovernmental agreements, but these charges should be limited to those for the preparation and distribution of data publications and the actual cost of copying and distributing original records such as streamflow measurements and water level recorder charts. Users should not be required to pay for the actual cost of gathering, compiling and processing these data."[201]

A further recommendation from the Pearse Inquiry on Federal Water Policy, proposing greater integration of

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Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 123.

[201] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 18.

the network between the Water Survey of Canada and the Atmospheric Environmental Services, would be beneficial in establishing a comprehensive network of automated data collection platforms.

In addition the Pearse Inquiry recommended that "The federal government should seek the cooperation of the provincial governments to extend the water data collection systems to include Canadian groundwater resources."[202]

The provincial government of Alberta indicated in response, that "Alberta has a well established network of stations and also obtains records from water well drillers operating across the province. Alberta would be prepared to cooperate with the federal government to extend and enhance the network where appropriate."[203]

The provincial government also supports the recommendation that, "Remote sensing and other advanced technologies should be explored with a view to effecting economies and improving water quantity and quality monitoring systems."

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[202] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 122.

[203] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 17.

[204]

Under the conditions of these recommendations a satellite, computer-based distribution system would be able to service otherwise inaccessible areas of Canada. Recommendations also included the application of a cost recovery system for data supplied to clients who are not party to federal-provincial data gathering agreements. The report also reorganized the capability of computer models as an analytical and interpretive tool that may support the data gathering network system. Remote sensing techniques and automatic data acquisition intrumention could be also have ongoing applications in Alberta and British Columbia with studies on basic glacier volume change monitoring programs under the Inlands Water Directorate.

These recommendations indirectly address the issue of Risk Management which "is one tool for managing instream uses. It does not solve issues but can permit justification in the decision making process."

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[204] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report -Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985).Page 122.

[205] from correspondence with J.D. McTaggart-Cowan,
Ottawa: Director, Office of Environmental Affairs,
Ministry of Energy, Mines and Resources. (1986).

Demands for drought or flood hazard reduction measures like forecasting and storage reservoirs may be expected to increase. Growing demands will place ever increasing pressures upon requirements for hydro-electric facilities, industrial, municipal and irrigation requirements. In Alberta, the impact of such flood forecasting would probably be most acutely felt in parts of the province that experienced extended periods without flooding.

The Water Survey of Canada provides a standardization of sampling methods, minimized duplication of sampling and a common data storage and distribution system that ensures the integrity of the data in a multi-jurisdictional water management system.

> In order to facilitate wider use of the data, the provincial government of Alberta supports the Pearse Inquiry recommendation that; "Environment Canada should publish a comprehensive directory of water-related data and sources."

[206]

Federal-provincial cost-sharing arrangements could further contribute to the cost-effectiveness of the system and reflect the user value for the data.

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[206] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985).Page 123.

4.1.3 WATER QUALITY MANAGEMENT.

Environment Canada's Water Quality Branch provides ambient water quality data and interpretive information on international, interprovincial and other waters of significant national interest. The National Water Quality Data Bank processes data from 670 stations across the nation and defines the health of Canada's water resources. Specific issues of concern include the provision of baseline water quality for environmental assessments of proposed developments; the development of water quality criteria and the subsequent formulation of regulations that would effectively meet the federal government's obligations under applicable legislation, federal-provincial and international agreements and treaties. Within this framework emerging pollution and transboundary movement of pollutants may be identified and permit the delineation of areas of pollution. The Water Quality Branch is also responsible for evaluating the effectiveness of the programs introduced.

During the International Hydrological Decade (1964-74) 1,000 water quality monitoring stations were established across Canada with one of the three regional analysis laboratories being established in Calgary. Other parts of this network were established in response to the International Joint Commission studies and as part of the federal-provincial river basin planning exercises. The network has been significantly pared back since its introduction - though stations have been retained on interprovincial waters where the federal government has made monitoring commitments, such as to the Prairie Provinces Water Board.

The current national water quality network is the result of federal-provincial cost-sharing agreements concluded in 1982. The issues of acid rain and toxic substances have been given significantly higher priority in the monitoring and analysis of impacts, under the revised network.

Networks are based on river basin requirements. Cost-sharing arrangements are concluded on the basis of the federal and/or provincial interest in each station. Federal government interests relate to international and interprovincial waters; northern and federal lands; long range transport of air pollutants, toxic chemicals and nutrient control.

Within these parameters, the objectives of the water quality assessment provisions are two fold. The first is the provision of scientific and technical information to advise governments, private and public agencies. The second objective is to detect emerging water quality problems and to evaluate the issues from regional and national points of view. In this evaluation, long term and emerging trends in water quality are used in assessing the regulatory measures currently in place. This process would also highlight areas in need of special investigations.

Federal-provincial negotiations are currently being undertaken between the federal government and the provinces of Alberta, British Columbia and Newfoundland for the purpose of establishing a National Monitoring Program. The adoption of federal-provincial cost-sharing and work-sharing agreements could potentially enhance coordination, improve data compatibility and promote the efficient use of available resources.

Toxic chemicals are an issue of growing concern nationally and internationally.

"To develop more effective controls over toxic substances and hazardous wastes; the federal government should:

i) designate the Minister of the Environment as the federal coordinator for toxics control;

ii) seek stronger intergovernmental coordination of control programs through the Canadian Council of Resource and Environment Ministers;

iii) promote a "cradle-to-grave" approach in controlling toxic substances;

iv) support investigations of new control policies through expert consultations convened by the Minister of the Environment."
[207]

In responding to this proposal from the Pearse Inquiry on Federal Water Policy, the provincial government of Alberta concurs that;

"that Canadian Council of Resources Environment Ministers should be the appropriate vehicle for intergovernmental coordination on the management of toxic substances and hazardous wastes."
[208]

Under the Toxic Chemicals Management Program, toxic chemicals are defined as those substances which, when released to the environment, or thereafter if chemically transformed through combination or otherwise, could pose a significant threat to natural ecosystems or to human health and well being.

"Concern over radioactivity and other man-made pollutants could be a major factor in the issue related to drinking water standards within the foreseeable future."

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[207] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 109.

[208] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 14.

209

A recommendation that followed from the Pearse Inquiry on Federal Water Policy was that, "The federal government should take the initiative in establishing minimum quality standards for drinking water throughout Canada by:

i) seeking the cooperation of the provinces in revising and expanding the existing national drinking water guidelines as a matter of urgency;

ii) inviting the provinces to participate in designing a model safe drinking water act suitable for adaptation and adoption by each jurisdiction;

iii) passing a safe drinking water act to apply to waters under federal jurisdiction."

210

The response from the Provincial Government of Canada was that "Alberta has consistently adopted through appropriate standards or regulations all agreed-upon national water quality guidelines.

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[209] from correspondence with G. Gorrell,
Edmonton: Director, Agriculture Canada. (1986).

[210] P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985). Page 108.

> Alberta is actively participating in the current review and updating of the Canadian Drinking Water Guidelines. The need for a safe drinking water act will have to be carefully examined within the context of the financial capability of provincial and municipal jurisdictions to provide the level of treatment necessitated if "unrealistically high standards" are established at the federal level."

[211]

Within the federal government the departments of Environment, National Health and Welfare, Fisheries and Oceans and Agriculture regulate the management of toxic substances through 58 Acts, administered by 24 departments, with programs coordinated by at least 80 mechanisms. An Interdepartmental Committee on Toxic Chemicals was formed in January, 1984 for an interim period of three years, to recommend action plans on five priority issues. The issues were:

(i) Drinking water safety
(ii) Contaminants in fish
(iii) Dioxins
(iv) Pesticides
(v) Indoor air quality

Membership of the ICTC includes senior officers from 11 departments: Environment (Chair), National Health and

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[211] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 8.

Welfare, Agriculture, Fisheries and Oceans, Transport, Indian Affairs and Northern Development, National Research Council, Consumer and Corporate Affairs, Regional Industrial Expansion, Labour and External Affairs. Observer status is provided for several central agencies including the Treasury Board and the Privy Council Office. The ICTC does not usurp the line of authority of departments; nor does it preclude existing procedures whereby departments work with central agencies such as the Treasury Board.[212]

The policy objective developed by the Interdepartmental Council on Toxic Chemicals is to: 'manage chemicals in Canada in a manner that permits enjoyment of the economic and social benefit to that accrued from their production, trade and use while achieving and maintaining a condition of the environment necessary for the health and well-being of human beings, protection and conservation of natural resources and the health and diversity of species and ecosystems, now and in the future.'

In order to accomplish this highly integrated quality management system, a consistent set of priorities and values must be in place. The socioeconomic value of water..."is one major issue

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[212] P.H. Pearse, F. Bertrand, J.W. MacLaren. Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985). Pages 158-160.

facing all Canadians in the next 20 years. Because Alberta has the potential for high resource use conflicts (hydrocarbon recovery /municipal /agriculture/hydroelectric/industrial),it may become a "testing" ground for evaluating water pricing schemes."
213

> Further to these considerations in determining the socioeconomic value of water "All water studies to date have been done on the basis of "free" water. A charge for water could have a major impact on heavy users, such as irrigation."

214

The economic and social impacts would be the economic contribution of the chemical industry to productivity in manufacturing, agriculture, forestry, mineral and other resource sectors, and the increased availability of chemicals used in promoting human and animal health and well-being.

Further constraints are that these socio-economic objectives would have to be attained without incurring adverse impacts from the production, distribution, use and disposal of chemicals in the environment, presently

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[213] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

[214] from correspondence with G. Gorrell, Edmonton: Director, Agriculture Canada. (1986).

or in the future.

In addressing the concerns over the adverse effects of industrial development, the Pearse Inquiry on Federal Water Policy recommended that, "The federal government, in consultation with provincial governments and industrial representatives should accelerate efforts to reduce industrial pollution by:

i) reviewing and upgrading schedules for compliance with industrial effluent regulations;

ii) extending the accelerated capital cost allowance for pollution control equipment to water conserving equipment;

iii) investigating other means of providing incentives and assistance for improving the control of industrial effluents;

iv) encouraging the development of corporate water conservation plans and quality control audits by providing information and other assistance.

[215]

In response to this recommendation the provincial government of Alberta has stated that "Alberta has

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[215] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report -Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 107.

> repeatedly guaranteed that it will uphold national water quality standards through the full use of the Alberta Clean Water Act. Alberta will move to accelerate the reduction of industrial pollution along national guidelines, but through the use of the Clean Water Act, not section 33(2) of the Fisheries Act."[216]

The level of interdepartmental cooperation required for the functioning of the Interdepartmental Committee on Toxic Chemicals provides an important insight into the potential levels of such integration.

Such levels of integration may, in part, be attributable to the particularly politically sensitive nature of 'quality of life' issues. Where perceived impacts upon quality of life are expressed through public opinion, significant attention is given to specific programs and policy statements at both the federal and provincial levels of government. This tendancy may be further illustrated by the distinct difference in the nature of the following discussion on Balanced Regional Growth.

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[216] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 13.

4.1.4 BALANCED REGIONAL GROWTH

> Riverbasin Planning "is the key mechanism for dealing with resource use conflicts and as such will form a focus for dealing with many issues of concern."[217]

> Riverbasin Planning has also been recognized by Agriculture Canada as being of "high" priority "because (Riverbasin Planning) can affect many people, and planning to date has been limited."[218]

This may, in part, be explained by the fact that, the federal government has rarely become involved in the development of water resources on a regional basis. Strategies in balanced regional growth have usually been confined to monitoring, research and planning in cooperation with the provinces as precursors to development or in support of international or interprovincial agreements to regulate development. Regional water quality management issues have been addressed through a variety of agreements, including comprehensive river basin planning agreements under the Canada Water Bill and federal-provincial planning agreements under the Canada Water Act. Issues in the lower Great Lakes have been directed through the International Joint Commission. Effective pollution control measures, including primarily municipal, and industrial waste treatment facilities have been generated through federal-provincial river basin studies.

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[217] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

[218] from correspondence with C.N. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

> The User-Pay Principle in water supply is "An important principle is water conservation and pollution clean up. A lot of thinking must take place before a truly equitable (across Sectors) arrangement can be developed."

219

> A similar view is shared by one respondent for Agriculture Canada, who stated that the User-Pay Principle in water supply was "good in principle but difficult and expensive to apply."

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[219] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

[220] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

More complex regional water quality management endeavours have been designed to generate a management program to guide future changes within the region and to preserve and protect the environmental stability while allowing the continued development of the areas as an economic resource. Such studies of land and water involve a large number of federal, provincial and municipal agencies and interest groups.

Issues in municipal sewage and water facilities have been addressed through this process. Major federal programs have been made available to assist municipalities.

A recommendation that was proposed by a respondent for the Federal-Provincial Relations Office of Environment Canada is intended to improve the process through which resource conflicts are resolved in cooperative Federal-Provincial agreements in water management are concluded.

> The recommendation involves amendments in jurisdiction over certain water rights and would..."elevate (negotiations) to a higher level than municipal" negotiations.

[221]

This statement suggests that the Federal-Provincial

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[221] from correspondence with M. Proctor-Twigg, Respondent, Federal-Provincial Relations Environment Canada. (1986).

> Relations Office of Environment Canada recognizes the relatively low priority that has generally been assigned to municipal water management strategies.
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> A similar priority status is assigned by a respondent for the Agriculture Canada for municipal waterworks and wastewater treatment. "Low (priority) as current treatment procedures are effectively in place."

[222]

The fundamental difference between the two statements is that the respondent for the Federal-Provincial Relations Office of Environment Canada is advocating that an increase in the profile of municipal waterworks and wastewater treatment is required for effective, comprehensive water resources management.

This trend appears to be recurrent in the historical development of municipal waterworks and waste treatment.The Municipal Improvements Act of 1938 was replaced by the Municipal Development and Loan Act in the early 1960s and made federal funds available for municipal sewage facilities and water systems development. During this later period the Canada Mortgage and Housing Corporation Sewage Treatment Program was initiated as an amendment to the National Housing Act. The program provided low cost loans with interest rates below market rates and a loan forgiveness feature that amounted to a grant of one-sixth of the capital costs. In 1975 this program was renamed as the Municipal Infrastructure Program, and its eligibility was expanded to include regional planning for sewage and water and the provision of water supplies to newly developing areas.

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[222] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

The major federal assistance programs for municipal sewerage and water system have been offered through CMHC, DREE and PFRA. Objectives of federal involvement have included direct employment generation, pollution control, residential development, industrial development, agricultural support and meeting treaty obligations. Behind all these objectives is undoubtedly a recognition of the inadequacy of municipal taxation powers to defray the costs of infrastructural needs. Municipal infrastructure clearly falls within the gambit of provincial jurisdiction for local works and undertakings.

> The increasing need to generate additional revenues through alternative strategies in water management is inferred in the following observation.
>
> "Agricultural, industrial and Municipal Water Users will be affected by user-pay-principles, price scheming and river basin planning."

[223]

In the late seventies, program amendments were made and in recognition of provincial and municipal responsibility for local works and undertakings, the Municipal Infrastructure Program was combined with other programs with a block-funding program known as the Community Services Contribution Program (1979). The Community Services Contribution Program was curtailed in 1980 on the grounds of questionable appropriateness for the federal government to continue funding services that were within provincial jurisdiction. Because the federal government was, therefore, not directly responsible for the expenditures, a second question of accountability arose over the government's collection of funds through taxation. With the end of the Community Services Contribution Program, the potential for federal contributions to municipal services, through a funding process, has been significantly reduced.

Through the, now defunct, Department of Regional Economic Expansion Act (1969), federal funding of municipal sewage and water facilities has been managed under the objective of regional growth. The General Development Agreements (1974) were concluded with all the provinces, except Prince Edward Island. These agreements have since expired and are now being replaced by Economic Regional Developments.

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[223] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

> In current priorities in municipal waterworks and wastewater treatment "Alberta currently treats 99% of sewer collected water. Treatment is expensive and may require higher taxing if water demands at the municipal level increases or populations increase."

[224]

The future inclusion of assistance for municipal infrastructure under Economic Regional Development agreements is uncertain.

> Environment Canada, is one of several agencies that recognizes the emerging escalation in conflict in water resources management between Agricultural and Industrial interests.
>
> "I expect that the greatest change will occur in agricultural and industrial uses for water resources."

[225]

A respondent for the International Institute for Applied Systems Analysis (Laxenberg, Austria) concurs with the observation that agriculture and industrial development will be specific sectors in which strategies and structures in water resources development will effect the greatest changes within the foreseeable future.[226]

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[224] from correspondence with J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

[225] from correspondence with R. Prach, Edmonton: Respondent, Canadian Wildlife Service, Environment Canada. (1986).

> In agricultural water use, "The need for water conservation, the problems of user-pay concepts for this sector and conflicts in water demand with other sectors makes this an important issue for Alberta."[227]

> One of the implications that reflect this need in agricultural water use, as perceived by a respondent for Agriculture Canada, is that; "The economics of irrigation will be looked at much more critically by comparison with other agricultural development possibilities or alternatives."[228]

The Prairie Farm Rehabilitation Administration has been the principal arm in implementing the Department of

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[226] from correspondence with Dr. C. Miller,
Schloss, Laxenburg, Austria: Research Scholar,
International Institute for Applied Systems Analysis. (1986).

[227] from correspondence with J.D. McTaggart-Cowan,
Ottawa: Director, Office of Environmental Affairs,
Ministry of Energy, Mines and Resources. (1986).

[228] from correspondence with G. Gorrell,
Edmonton: Director, Agriculture Canada. (1986).

Regional and Economic Expansion programs in community water and sewage services in Alberta, since 1969. The PFRA has proved to be the exception to the federal government's non-involvement in the development and operation of water resources on a regional basis.

The mandate of the PFRA is to secure rehabilitation of drought and soil drifting areas and promote systems of farm practice, tree culture, water supply, land utilization and land settlement that will accord greater economic security.

> "The prairie regions of Canada have specific and unique water management concerns related to maintaining a healthy agricultural industry. The PFRA has developed particular expertise in the area and demonstrated sensitivity in dealing with provincial governments. This experience should not be lost or diluted."

[229]

The PFRA is intimately involved in water resource development on the southern prairies, ranging from the provision of small water sources on individual farms through to systems designed to meet the needs of small groups of farms and to large scale systems to irrigate substantial districts and provide secure municipal water supplies. Engineering and planning services to assist the provinces in developing long range water supply and and drought proofing programs are also available.

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[229] See correspondence with Walter Solodzuk, P. Eng., Director, Office of the Deputy Minister

Since 1973, Alberta's provincial government has assumed the operation of PFRA irrigation systems as restored by the PFRA,with funding from the Federal Government.

Through the Agricultural Services Centre Agreement (1972), dams and dugouts have been developed for community water supplies. These agreements applied to rural communities with populations over 2,000, and expired in 1979, in Alberta. Under these programs the federal government assumed between 70 and 90 of the project costs under the cost-sharing formulae.

Prairie communities with populations less than 2,000 were addressed under the Interim Subsidiary Agreements on Water Development for Regional Economic Expansion and Drought Proofing (1979). A 50:50 cost-sharing formula was concluded under the agreement, with engineering services supplied by the PFRA and required lands provided by the province. Of the three prairie provinces, Alberta was the only province not to enter the agreement. This program expired on March 31, 1983. Although a similar program was renewed with Saskatchewan in 1984, Alberta has not expressed interest in similar cooperative programs for community services.

conducive to the conclusion of cooperative federal-provincial agreements, however...potential does exist for federal-provincial cooperation in the resolution of these issues.

"some mechanisms already exist for consultation such as the PPWB or water quality agreements. Other mechanisms could be developed if needed."

230

The Prairie Farm Rehabilitation Administration is currently cooperating with the Water Supplies Assistance Program in Alberta.

"The Alberta Water Supplies Assistance Program was announced April 21, 1988 by the Honourable Don Getty, Premier of Alberta. The program jointly administered by Alberta Environment, Agriculture, Transportation and Utilities and Forestry, Lands and Wildlife was developed to assist rural Albertans who are experiencing water shortages. Below average run-off, combined with several years of limited precipitation, has resulted in depleted farm water supplies, and in some rural communities, low domestic water supplies. The following describes the program offered by the departments of Environment, Agriculture, Transportation and Utilities, and Forestry, Lands and Wildlife."

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230 [illegible] with J.D. [illegible], [illegible] Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. [illegible].

[231] Under the Grazing Reserve Water Supply Program, funding is provided to develop water wells and other water supply sources on grazing reserves throughout the province, to allow the continued use of grazing reserves during 1988. Holders of grazing leases are eligible for assistance through the Prairie Farm Rehabilitation Office, Alberta Agriculture and Alberta Environment. For dugouts on grazing leases, 87 rural leaseholders are eligible for assistance through the PFRA. Assistance for drilling wells is also being provided by the PFRA and the Alberta Environment Regional Offices.

Within the Water Supplies Assistance Program, Alberta Farm Water Grants are available through Alberta Transportation and Utilities. Based on long term water requirements, capital grants are provided to farmers and ranchers to assist in the construction of water conveyance facilities for domestic and stockwater use. Grants cover 75% of the eligible cost of construction, up to a maximum of $15,000 per unit.

Alberta Agriculture is supporting a three-point dugout program. The program includes dugout construction, rehabilitation and dugout pumping.

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[231] Kowalski, K. A message from the Chairman of Alberta's Water Supply Action Committee. Alberta Water Supplies Assistance Program. Edmonton: Alberta Environment. (1988).

DUGOUT CONSTRUCTION

To assist farmers to develop dugouts and stock watering facilities as water sources. Alberta Agriculture will match the financial assistance provided by the Prairie Farm Rehabilitation Administration (PFRA) for individual farm water source development projects.

This assistance will amount to an additional one-third of the eligible cost or specified unit cost allowance (excavation 22 cents per cubic yard), whichever is less, to a maximum of $1,650 per project and bring the total assistance available from both sources to a maximum of $3,300 per project. Farmers are required to obtain approval from the PFRA prior to the development of a project, in order to obtain PFRA funding.

DUGOUT REHABILITATION

Additionally, Alberta Agriculture will provide assistance to bona fide farmers or ranchers wishing to rehabilitate existing dugouts. Financial assistance will be provided on the basis of one-half the eligible cost of restoring or improving dugouts up to a maximum of $1,650.

Eligible cost will include excavation and sealing or lining, providing the finished dugout meets PFRA minimum size and depth requirements.

These are 2,616 cubic yards and a minimum depth of 14.75 feet for year round water supplies. Side slopes of 1.5 to 1 and end slopes of 4 to 1 are recommended.

DUGOUT PUMPING

Fees for rental of Alberta Agriculture's pumping equipment have been reduced by 50 per cent. The 1988 fees are:

- $50 for first pump
- $25 for the second or subsequent pump
- $100 for the first mile of pipe of portion thereof and trailers

The program will terminate as of December 31, 1988. All construction must be completed by the date.

The section of the Water Supplies Assistance Program that focuses upon the issue of water supplies for rural landowners, is administered by Alberta Environment.

Under the terms of the Water Supplies Assistance Program:

"Alberta Environment will consider applications from rural landholders (farmers, ranchers, acreage owners) for financial assistance for construction of a new well to replace an existing water supply that has become depleted, or for improvement of an existing well. Assistance is one third of the eligible invoiced costs up to a maximum of:

- $7.00 per foot of cased depth for small diameter wells.
- $16.46 per foot of cased depth for large diameter wells.

To encourage development of high quality and deeper, more drought-resistant wells, Alberta Environment is providing the following additional incentives for any well developed under this program.

- for approved well screens - $100
- for sandpacks - $50
- for approved drawdown and recovery pump tests - $200
- for deep wells - twice the normal level of assistance will be provided for the portion of the developed well deeper than 235 feet.

If a well driller is unable to complete a well on a specific quarter section of acreage, assistance will be provided to offset the dry hole charges up to one-half the eligible invoiced costs, to a maximum of $3 per foot for small diameter wells and $15 per foot for large diameter wells.

Alberta Environment will consider applications received up to March 31, 1990.

Bona fide farmers and ranchers may be eligible for

> additional assistance of up to $1,650 under the Prairie Farm Rehabilitation Administration's (PFRA) rural water development program."

232

Although this program was not concluded under one of the federal-provincial structures, considerable federal-provincial cooperation is evident in the design, implementation and administration of the program.

In addressing the needs for community water supplies, and under the terms of the Alberta Water Supplies Assistance Program, Alberta Environment will consider requests from local governments to replenish existing water supplies or develop temporary replacement water supplies for those that have been depleted. Requests will also be considered from rural local authorities where a number of landowners use a centralized water supply. Only critical water shortage situations are eligible for assistance.

Alberta Environment will fund the cost of either replenishing a water supply, providing a temporary replacement water supply, or modifying existing works that have been damaged or are deemed ineffective due to current dry conditions. Pumping, temporary structural measures, and temporary wells will be

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[232] K. Kowalski. "A Message from the Chairman of Alberta's Water Supply Action Committee." Alberta Water Supplies Assistance Program. Edmonton: Alberta Environment. (1988).

considered for provision of a raw water supply near a community.

Local governments remain responsible for treating, delivering, and distributing the water right-of-entry, land control for construction, operation, maintenance, permits, public liability and related costs. If the facilities are improved and become permanent, local governments will assume ownership and ensure compliance with all applicable legislation. All temporary facilities will be removed by the local government when they are no longer needed.

The final section of the program focuses upon individual farmers that have become involved in water hauling as a result of the drought conditions.

> "This program is designed to assist bona fide farmers and ranchers to haul water in cases where the shortage is a result of depletion of existing sources (i.e. wells, dugouts, dams). The basis of financial assistance will be the lesser of one-third the invoiced cost of $0.80/1000 gal/loaded mile for the initial five miles or portion thereof of the hauling distance from the water source and $0.55/1000 gal/loaded mile for additional hauling distances over five miles, to a maximum of $2.000 for hauling distances of five miles or less OR $2.750 for hauling distances

> greater than five miles."[233]

> In a statement made by the Head of the Soil Science Section of Agriculture Canada (Lethbridge), in support of the need for PFRA program:
>
> Agricultural water use is assigned a high priority and..."potential for improvement is high, but the public has the mistaken idea that water is commonly wasted. Underuse is more common."[234]

Other active province wide programs that fall within federal-provincial program structes and that are currently under Environment Canada sponsorship include the Water Quantity surveys and Flood Damage Reduction Programs. Cooperative federal-provincial programs in water quantity surveys originated with the enactment of the Northwest Irrigation Act of 1894. This cooperation was formalized in 1975, with the signing of uniform cost sharing agreements with each of the provinces, including Alberta. Shared survey information results from the agreement and provides a basic component of federal and provincial water research and management programs. The only limitation experienced in this program has been the reduction of water quantity surveys as a result of fiscal restraint.

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[233] K. Kowalski. "A Message from the Chairman of Alberta's Water Supply Action Committee." Alberta Water Supply Assistance Program. Edmonton: Alberta Environment. (1988).

[234] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch Agriculture Canada. (1986).

Subsidiary to the DREE General Development Agreements between the provinces and the federal government, both Saskatchewan and Manitoba entered agreements on water development and flood proofing, in 1979 and 1980 respectively. These agreements provided for development of strategies to improve the effectiveness of water management, analyses of supply and demand for water, drought sensitivity analyses, and the provision of water supplies and delivery systems. Under a 50:50 cost-sharing agreement, drought sensitivity models have been developed for both Saskatchewan and Manitoba, allowing analyses of the impacts of drought periods and the estimated effects of water development alternatives.
Alberta is not a participant in the cooperative federal-provincial, province wide program in flood damage reduction. The program has been in place since 1976, and is intended to provide flood risk mapping and to discourage further occupancy and development of high flood risk areas.
Terms of the program are that participating governments must agree not to engage in, or provide assistance for, undertakings that are vulnerable to flood damages in designated high flood risk areas. In such areas, federal disaster assistance will be restricted to

structures built before the designation and, in some circumstances, new structures that are flood proofed. Zoning on the basis of flood risk is encouraged. Province wide flood damage reduction agreements are generally for a period of ten years, with the opportunity for amendments during that period. The provinces sign a Mapping Agreement which is designed to provide flood risk mapping and designation of high flood risk areas. Flood forecasting, studies and specific water body programs are entered into on a sub agreement basis. The set of principles established by the federal government as a prerequisite for acceptance in the program has been cited as one reason for Alberta's reluctance to participate in the cooperative program. Proposals are currently being reviewed for the establishment of province wide water quality monitoring programs. Largely due to questions of fiscal restraint, Alberta has not as yet concluded a water quality monitoring agreement, although such an agreement is in place in Quebec.

Recent flooding experienced in Alberta in 1986 had the potential to fuel interest in the provincial government's possible particpation in the federal-provincial Flood Damage Reduction Program, along with further participation in cooperative Water Quantity Surveys. There have been no indicators of any such interest to date. In an interview setting in 1987, the

Alberta Minister of Environment indicated that flood relief measures were implemented successfully within a reasonable period of time, and that no additional measures involving federal government participation were deemed necessary at this time.

Other areas in which further development in province wide programs could be introducted to promote balanced regional growth include:

(i) soil and water conservation districts program

(ii) comprehensive river basin planning programs

(iii) harmful chemical and toxic contaminant survey and monitoring

(iv) rehabilitation and upgrading of municipal water supply and sewerage systems

(v) water pricing programs.

Other federal agencies that have sponsored province wide water managment programs in the past have been:

(i) Department of Regional Industrial Expansion (currently under reorganization).

(ii) Department of Regional Economic Expansion

(iii) Department of Agriculture (including the PFRA)

(iv) Ministry of State for Economic and Regional Development.

With the recent reorganization of certain federal government agencies, the orientation of agreements is keyed more towards the economic development aspects of water use.

Effectively, on the 4th August, 1987, the Department of Regional and Industrial Expansion became the core for the new Department of Industry, Science and Technology.

> "The Canadian economy faces a new era of international market competition driven by unprecedented scientific progress and technological change. If we are to meet this challenge, we need to work together to prepare our industrial base to face global competition head on. That is why, On August 4, 1987, the Prime Minister, announced the creation of the Department of Industry, Science and Technology (IST) as a "flagship" for the government's economic development efforts.
>
> Canada is a formidable trading nation and its strength lies in its ability to trade freely with the rest of the world. The stability of and access to international markets are currently under stress. Canada can ensure its capacity to compete not only by doing what we do, better, but also by developing products and services that are different from those of the past. We are all involved in a new venture and we must put our best minds to work in developing new ideas and concepts that wil lead us as a nation into the 21st Century.
>
> The primary goal of the new department is to

> contribute to improving Canada's scientific and technological base in order to promote a more internationally competitive industrial economy, and to act, throughout the federal government, as an effective and reasoned advocate of the science and industrial communities.
>
> This document has been prepared to stimulate discussion and focus on issues which affect our nation's competitiveness. The Department of Industry, Science and Technology will work with you to ensure that the needs of business, workers and the science community are met in the fulfillment of our mandate."[235]

Since the establishment of the mandate for the Department of Industry, Science and Technology; the Programs of Industrial and Regional Expansion and Agricultural Process and Marketing have been transferred to the Western Diversification Office in Alberta.

These programs will presumably be managed under the Western Diversification Fund.

> "Canada's four Western provinces have enormous wealth and vitality, founded on the resources of agriculture, forestry, mining and lake and coastal fisheries. Throughout this century they have

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[235] The Honourable Robert R. de Cotret,
Minister of Regional Industrial Expansion
and Minister of State for Science and Technology. (1987).

> contributed to the rapid development of the country.
>
> The West remains vulnerable, however, to the uncertain demands of international markets and the fluctuation of prices for its products. The result has been the creation of a "boom and bust" economy which has had damaging effects on employment growth and social stability.
>
> To counter these periodic ups and downs of the marketplace, and to broaden and strengthen the economic base of the West, the federal government has set up a $1.2 billion investment fund under the Western Diversification Initiative.
>
> The Western Diversification Program is a part of the Western Diversification Initiative announced by the Prime Minister on August 4, 1987. Funding for approved diversification projects will be delivered under the Program."

[236]

Further diversification in the water resources sector would be encouraged under the recommendations of the Task Force on the Environment and Economy that was concluded by the Canadian Council of Resource and Environment Ministers in September, 1987 as a general resource management strategy, the Task Force advocates that;

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[236] The Honourable R. de Cotret, Minister of Regional Industrial Expansion and Minister of State for Science and Technology. (1987).

> "Our main objective is to promote environmentally sound economic growth and development, not to promote either economic growth or environmental protection in isolation. Complete integration of the environment and the economy would be a tall order in any country; it is made no easier by the complexities of the Canadian mosaic. We believe, however that such integration is possible. In fact, we believe that it is absolutely necessary. With goodwill, leadership and new processes for decision making and planning we can meet our responsibility to future Canadians by managing carefully and protecting the resources we hold in trust for them.
>
> Long-term economic growth depends on a healthy environment. It also affects the environment in many ways. Ensuring environmentally sound and sustainable economic development requires the technology and wealth that is generated by continued economic growth. Economic and environmental planning and management must therefore be integrated.
>
> These ideals cannot easily be put into practice through political, social and economic structures which have been designed for other purposes. The principles of shared responsibility and integrated

decision making must become the foundation of our institutions and guide our key decision makers. One of the most important of our recommendations proposes a new co-operative initiative to integrate economic and environmental planning through the participation and debate of senior decision makers in every province and territory at the national level in Canada. We have called for the creation of Round Tables on environment and economy, to provide a forum for these decision makers to work towards a concensus on this fundamental issue.

We give support to the development of "conservation strategies" in every Canadian jurisdiction. Our primary interest in such strategies is to use them as a basis for development which ensures that the utilization of resources today does not damage the prospects of future generations for maintaining or improving their use. We are convinced that the problems of the past can be largely avoided by making use of the technologies and knowledge that we already possess or are now developing. We, therefore, recommend the development of conservation strategies as a valuable multi-sectoral approach to defining and implementing sustainable economic development.

We have made specific recommendations to explore tools and technologies which can assist all of us to better understand the linkages between the environment and the economy. In this way it will be increasingly impossible to provide incentives systems which lead more systematically to economically and environmentally sound development. Given the recognition that environmental considerations are essential to social and economic planning, Canada's cabinet chambers and boardrooms must assume new responsibilities. We have made recommendations in leadership in government and industry which reflect and reinforce these responsibilities. We have also recognized the leadership role played by non-government organizations with respect to the early identification and public debate on environmental issues.

Furthermore, the economy and its participants exist within the environment, not outside it; we cannot expect to maintain economic prosperity unless we protect the environment and our resource base, the building blocks of development. Correspondingly, economic growth and prosperity provide us with the capability to support wise resource management and protect environmental quality. For this reason, we support the goal of sustainable economic development which we generally define as development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations.

At the core of the concept of sustainable development is the requirement that current practices should not diminish the possibility of maintaining or improving living standards in the future. This means that our economic systems should be managed to maintain or improve our resource and environmental base so that the generations that follow will be able to live equally well or better. Sustainable economic development does not require preservation of the current stock of natural resources or any particular mix of human, physical and natural assets. Nor does it place artificial limits on economic growth, provided that such growth is both economically and environmentally sustainable. Sustainable economic development implies that resources and the environment must be managed for the long-term, taking into account their possible value in the future as well as their value now.

Governments and industry have reacted to correct many of the problems created by past mis-management of the environment. Sustainable economic development calls for a different approach. It would minimize environmental impact and future clean-up costs by advanced and integrated plan. In a phrase, the remedial, reactive approach would be replaced by "anticipate and prevent" as the dominant concept underlying environment-economy integration.

The political and economic structures of Canada and the world are awakening to the need to make economic development sustainable. Decision making has not yet adapted to fullfil this need. Change is necessary, and it must occur now.

Efforts have been made in Canada to achieve sustainable economic development. The greatest weakness in these efforts has been the sectoral approach to planning and development. This too is starting to change, but the process must be accelerated. Governments increasingly recognize that they hold resources in trust for both present and future generations. Industry is increasingly working towards long-term environmental solutions. Limited progress to date by all sectors is a relection of the complexity of the problems and of structural limitations in our economic, social and political systems.

The goal of sustainable economic development cannot be attained without significant change in the way our economic initiatives are planned and supervised. This makes it a challenging goal, even more so in the Canadian context because it will

> require different approaches in various economic sectors and political jurisdictions across the nation, although the same underlying principles should apply to every jurisdiction."[237]

In concurrence, the federal and provincial governments need to assess carefully and consider the economic costs and environmental consequences associated with all water resources development programs to ensure the maintenance of balanced regional growth and the protection of other water and related resource values.

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[237] Canadian Council of Resource and Environment Ministers. Report of the Task Force of the Environment and Economy. Ottawa: Government of Canada. (1987). Page 2-3.

4.1.5 RESOURCES DEVELOPMENT

> "I would hope that federal-provincial cooperation is currently available in areas with joint responsibility and for programs where Canada supports regional water development projects. Alberta expects to receive a fair share of financial support for such programs to assure its equity share of funding compared to regional support elsewhere in Canada."

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Since the 1960's the federal government has recognized the need for improved interdepartmental cooperation in the management of water as a resource.

> "I believe that the environmental agencies through federal and provincial environmental review procedures have made progress in incorporating the full range of concerns raised unless conflicting issues for scarce common resources arise."

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[238] from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

[239] from correspondence with R. Prach,

In 1968, the Interim Interdepartmental Committee of Water (ICW) was established. The mandate of the committee was to consider and approve all federal government water programs until a permanent mechanism was established, and a committee of ministers was nominated to formulate a permanent mechanism for resolving interdepartmental conflict on water programs. Following the passage of the Canada Water Act (1970), the committee adopted a revised mandate.[240]

Although the committee of ministers was never convened, the ICW continued to operate under the original mandate until 1975. The committee was to consider and make recommendations on all federal water policies and programs in order to ensure that all federal efforts were directed towards the same objectives. The coordination of agreements entered with the provinces on the formulation and implementation of comprehensive river basin and water quality management program were included under the revised mandate. Recommendations on the policies and program matters of interdepartmental

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Edmonton: Respondent, Canadian Wildlife Service, Environment Canada. (1986).

[240] D. De Pape. "Federal-Provincial Co-operation in Water - An Exploratory Examination". Inquiry on Federal Water Policy Research Papers. Ottawa: Government of Canada. (1985). Pages 61-68.

significance were reported by the ICW through the Minister of Environment. Under the amended mandate the ICW is required to provide recommendations on all federal water policies and programs rather than ICW approvals as required in the original mandate. In recent years fewer major initiatives have been proposed by departments and agencies such as the PFRA have attempted to have irrigation programs approved without interdepartmental review.
241

It has been noted that the ICW plays an essential and effective role in coordinating and integrating federal water programs, particularly during the current fiscal restraint and growing complexity in water issues. If the ICW is to be effective in reviewing and making recommendations on federal water initiatives, a considerably more explicit and detailed water policy is required to clarify specific integrated policies, and establish a set of comprehensive working programs. At the federal level, the ICW could provide an effective vehicle for proposing and developing a set of water management directives in an interdepartmental forum, the contributing agencies would provide a program that all agencies can support.

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J.S. Mactavish. "The Federal Role in Water Management." Inquiry on Federal Water Policy Research Papers. Ottawa: Government of Canada. (1985).

In support of this concept;

> "The primary set of benefits (to be gained from federal-provincial cooperative programs) arise from the more objective view that federal participation can bring to the process."

[242]

In the federal government, forums designed to promote federal-provincial cooperation take on a variety of forms. The Federal-Provincial Advisory Committee in Environmental and Occupational Health advises ministers of Health on waste quality issues. During the 1970's consultative committees on water were established for senior provincial officers and Environment Canada to review water management issues. Since their inception, meetings of the consultative committees have become increasingly infrequent.

In part, the limitations and elusive nature of the mechanism used to forge many cooperative water management agreements are alluded to in the following observation.

> "If neighbouring provinces are downstream or upstream users of a particular watershed, they must be included in either scenario. The federal government only has an active role in an

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[242] from correspondence with R. Prach,
Edmonton: Respondent, Canadian Wildlife Service,
Environment Canada. (1986).

interprovincial issue if there are federal funds or lands involved, or they have been specifically asked to participate by the provinces. This role would be continued under either scenario, but does not preclude Alberta entering into cooperative agreements with other provinces when the issues do not involve the federal government."
243

"While neighboring governments should be involved, inter-provincial bodies should not be alternatives to federal-provincial decision making."
244

Furthermore, the primary set of benefits to be gained from federal-provincial cooperative programs, as opposed to interprovincial programs in Alberta water management would be the...."Availability of federal funding for programs. Federal role as an arbitrator of disputes. Better links with federal legislation and in the case of water export, the opportunity to work out problems early in the project proposal stage. Better links with federally supported

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from correspondence with J.D. McTaggart-Cowan,
Ottawa: Office of Environmental Affairs,
Ministry of Energy, Mines and Resources. (1986).

244

from correspondence with C.W. Lindwall,
Head, Soil Science Section,
Research Branch, Agriculture Canada. (1986).

research activities."
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An alternative body has been the Canadian Council of Resource and Environment Ministers which has provided a neutral forum at the national level. This council is also a consultative body of ministers from the provincial and federal governments. As a non-voting forum, the Canadian Council of Resource and Environment Ministers has proven effective in establishing mutually acceptable approaches to sensitive issues. As a result, the council convenes at regular intervals across the country.

Within the Task Force on the Environment and Economy (September, 1987), the Canadian Council of Resource and Environment Ministers provided several recommendations aimed at enhancing an understanding of the linkages between the environment and the economy. These recommendations have particular application in the water resources development sector and are given as follows:

- "Government, industry, academic and other non-government organizations should develop new tools and improve existing tools which achieve more efficient and effective environment-economy

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245
from correspondence with J.D. McTaggart-Cowan,
Ottawa: Director, Office of Environmental Affairs,
Ministry of Energy, Mines and Resources. (1986).

integration. These tools should include consideration of, where appropriate, application of:

- analytical methodologies and techniques such as cost benefits analysis, risk assessment, and increased use of environmental impact assessment.
- economic mechanisms such as containment charge schemes, tradable emission/discharge rights, financial assurance and performance deposits, investment tax credits, credits for exceeding environmental standards and reduced interest bonds.
- information generation and reporting systems such as state of the environment reporting;
- improved techniques for the valuation of environmental stresses and the benefits of environmental protection;
- economic incentives which promote effective environmental protection by business;
- government, industry and non-government organizations should use multi-partite processes to deal with specific issues, projects or programs;
- various jurisdictions and economic research organizations, such as the economic council

of Canada, should explore opportunities and pricing mechanisms for promoting efficient resource utilization and environmental quality;

- a system for measuring the contribution of the environmental sector, including natural resources, to the national economy and national wealth should be developed, drawing upon the work of existing organizations (e.g. Economic Council of Canada, Statistics Canada).
- greater resources must be dedicated to co-operative research and the development of common databases by government and industry;
- special emphasis is required on research into and promotion of waste disposal and recycling, as well as environmental clean-up and enhancement technologies and techniques;
- more research is needed on the concept of sustainable economic development and the linkages between economic development and the environment so that we can better understand those linkages and apply data and information to make better decisions;
- specific projects demonstrating

environment-economy integration should be developed and implemented, with multi-sectoral involvement, in every province/territory at the national level;

- outstanding work on environment-economy integration and environmental excellence should be recognized by awards. The proposed Round Tables should make these awards annually. The Round Tables should also identify projects which successfully integrate environment and economic development, and communicate these to the public."

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In these broader issues of resource development, the involvement of such departments as National Health and Welfare has been suggested in order to encompass the full range of priority concerns in future accords. More extensive use of sub-agreements has been proposed as a method of specifying the cost-sharing and work sharing formulae to be used in the implementation of these new accords.

Within the federal-provincial cooperative program

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246 Canadian Council of Resource and Environment Ministers. Report of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Page 5.

structure, a respondent from the Department of External Affairs observes that:

> "The federal government could help coordinate interprovincial programs in water management."
[247]

> "The Prairie Provinces Water Board, as an example, has successfully administered and advised the individual governments on water apportionment and related issues. The results of this activity have been good and might be considered a model for other Canadian situations."
[248]

At the specific program level, each new federal-provincial agreement has provisions for some form of bilateral arrangement to manage the program. The issues don't appear to be the availability of coordinating forums but are, in fact, the different cost-sharing arrangements that are available from different federal departments. Programs under the Canada Water Act and certain flood control agreements proceed with 50:50 cost-sharing. Cost-sharing formulae used in water quality and quantity monitoring are dependent upon the relative priority of federal and provincial governments involved in the program. Alternatively, programs in water development that are sponsored by the PFRA and formerly by the Department of Regional Industrial Expansion provide higher levels of federal financing under these circumstances. Recognition that more formalized arrangements are required to ensure federal-provincial cooperation, has resulted in the Accords for the Protection and Enhancement of Environmental Quality. The Accords are designed to provide a single government process through which public concerns over environmental issues could be addressed. These accords were signed by eight out of ten provinces in 1975. One limitation identified in the Accords was that the national baseline standards do not acknowledge the disparity in regional resources for the enhancement of environmental quality.

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[247] from correspondence with J. Carson,
Ottawa: Respondent, Department of External Affairs. (1986).

[248] from correspondence with R.H. Cronkhite,
Edmonton: Executive Director,
Alberta Water Resources Commission. (1986).

In the implementation of any such Accords, a fundamental assessment in the strategies employed in the development of any form of resources, has to be the degree of cooperation that can be expected from all levels of government involved.

Following from the Pearse Inquiry on Federal Water Policy were a series of recommendations, aimed to improve the level of cooperation between the Federal and

Provincial governments in water resources development.

One of the recommendations addressed the issue of a National Water Conservation Program, in which

> "The federal government should invite the provincial and territorial governments to collaborate in a National Water Conservation Program. This program should be embodied in general water conservation and development agreements between the federal and provincial and territorial governments. These master agreements should:
>
> i) be designed in consultation with the provinces and territories;
>
> ii) include a general commitment to cooperation in water matters and set out the principles and conditions of cooperation;
>
> iii) provide for supplementary agreements on specific collaborative programs;
>
> iv) specify consultative arrangements to oversee joint undertakings."

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The Alberta government response was that, "It is Alberta's view that existing federal-provincial

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P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.
Ottawa: Government of Canada, (1985).Page 170.

agreements are sufficient for any future joint undertakings in such areas as water conservation."[250]

Furthermore, in an excerpt from the Currents of Change - Final Report; "The federal Minister of the Environment should invite the Canadian Council of Resource and Environment Ministers to assist in designing the National Water Conservation Program,"[251]

The provincial government responded that "While Alberta supports the intent of this recommendation it is noted that not all provincial ministers responsible for water management are members of CCREM. It will be necessary to ensure that these ministers are included in this initiative."[252]

In addressing the issues of improved Intergovernmental communication and consultation, the Pearse Inquiry recommended that;

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[250] Alberta Environment, Submission of the Alberta Government with respect to the Final Report -Inquiry on Federal Water Policy, Edmonton: Alberta Government. (1986). Page 19.

[251] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 170.

[252] Alberta Environment, Submission of the Alberta Government with respect to the Final Report -Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 19.

"The federal government and each provincial and territorial government should establish a joint management committee to negotiate and supervise the implementation of their water conservation and development agreements."
253

The Alberta government indicated that "If Alberta should choose to enter into either water conservation and/or development agreements, it concurs that a joint management committee would be an appropriate vehicle for directing joint initiatives under such agreements."
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In a similar fashion, the provincial government's response to the proposal that "The federal government should designate an official in each province and territory to coordinate and provide information about federal water policies and programs,"
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253
P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.
Ottawa: Government of Canada. (1985).Page 171.

254
Alberta Environment, Submission of the Alberta Government
with respect to the Final Report -Inquiry on Federal Water Policy,
Edmonton: Alberta Government. (1986). Page 20.

255
P.H. Pearse, F. Bertrand, J.W. MacLaren,
Currents of Change Final Report - Inquiry on Federal Water Policy.

was that;

"It is Alberta's view that existing arrangements are adequate."
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Within comprehensive water resources development, the spirit of cooperation between the federal and provincial levels of government is an integral link in being able to integrate water resources programs that span countless water associated departments and range through numerous levels of government.

The Pearse Inquiry addressed this issue and recommended that "Environment Canada should initiate and support a national water conservation awareness program, similar in organization and approach to the participaction program."
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The position of the provincial government of Alberta was that "Alberta does not require "the federal government to provide leadership in directing attention and resources to urgent problems and to implement the approaches to water

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Ottawa: Government of Canada. (1985).Page 171.

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Alberta Environment, Submission of the Alberta Government with respect to the Final Report -Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 20.

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P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985).Page 174.

> resource management..." Alberta is aware of the need for raising the public's interest in water conservation. However, each province will have specific provincial needs and regional needs, best addressed within the framework of overall provincial policies. Should the federal government wish to take an active role, it can do so by providing financial assistance through redirection of existing program funding. Federal duplication of existing provincial water planning and management activities is unwarranted, but particularly so in the current times of fiscal restraint and deficit cutting initiatives."

[258]

However, with the implementation of the CCREM Task Force on the environment and the economy, a significant change in position with respect to integrated environmental and economic resources development policy should be realized.

> "In an era of environmentally sound economic development, a full partnership of governments, industry, non-government organizations and general public must guide us through an integrated approach to environment and economy. Environmental

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[258] Alberta Environment, Submission of the Alberta Government with respect to the Final Report -Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 21.

organizations will continue to fulfill an important role as advocates for the environment. Governments and industry, however, must develop and assume new responsibilities to successfully integrate economic considerations into economic planning.

Governments act as trustees for the resources they will pass on to future generations. Governments must therefore exercise comprehensive and farsighted leadership in supporting and promoting sustainable economic development. Governments can supplement regulatory control with incentive mechanisms. They can open planning processes to participation by groups which have a stake in development decisions. They can strive for harmony in environmental standards and processes across the country.

In accepting this responsibility, governments will have to change the way they approach the environment and the economy. They must integrate environmental input into decision making at the highest level. Environmental consideration cannot be an add-on; an afterthought. They must be made integral to economic policy making and planning and a required element of any economic development proposal.

The First Ministers regularly address economic development issues at federal-provincial conferences. Environmental issues should have comparable and closely linked prominence. Such top level co-ordination must also take place at the highest levels within governments. This includes cabinet committees and key economic development committees. These committees must accept and understand the inter-dependence of the economy and the environment.

Increasingly, industry finds that environmental and economic benefits can be complementary. At times, however, environmental benefits entail substantial expenditures, and this should be recognized as a cost of doing business. In both cases corporations show leadership by fulfilling their responsibility to conserve resources and protect the environment. All corporations should adopt codes of practice which enshrine this responsibility.

Industry leaders recognize the direct benefits of reduced clean-up and remedial costs and the indirect benefits in quality of life to be achieved by environmentally sound economic development. What is best for the environment, however, may represent an expensive policy for individual corporations if their competitors are achieving lower costs by ignoring environmental standards. In such cases governments have a role to play in promoting fair competition and ensuring environmental protection. Such government action rests upon a foundation of support by industry, non-government organizations and, ultimately, the people of Canada.

Industry associations can achieve better integration of environmental and economic concerns by adopting codes of practice to govern and guide industrial decision making. Codes of practice can be used to establish internal goals and performance standards for industry on environmental matters which go beyond the minimum regulatory requirements while maintaining sensitivity to costs and other economic factors. Industry is best able to assess its own capabilities and opportunities and should be given incentives and recognition for improving environmental performance.

Associations can also contribute to the environmental conscious of small to medium sized firms, which may lack the resources to retain environmental specialists, by sharing information on links between the environment and the economy.

The Task Force acknowledges that leadership takes many forms. While industry and governments are major economic decision makers and must show leadership in investment decisions and economic policy making and planning, environmental organizations are leaders in the early recognition of and public debate on environmental issues. Over the past decade, moreover environmental organizations have evolved considerably in sophistication and capability. Many of these organizations have drawn memberships and expertise from the industry and government sectors. Labour organizations have similarly given increased priority to workplace safety and health conditions and have become strong supporters of environmental causes. Aboriginal groups are a major force calling for conservation and the preservation of cultural and heritage resources. These trends are welcome and indicate that we can move into a new era of co-operation and partnership which makes both economic and environmental sense."

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Current initiatives in government water management strategies are thus focussed upon securing a viable, environmentally, socially and economically balanced policy in water resources management.

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Canadian Council of Resource and Environment Ministers. Report of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Pages 6-9.

4.1.6 FOREIGN MARKETS DEVELOPMENT

One of the primary limitations in the development of foreign markets involving Alberta water resources, revolves around the potential that exist for federal-provincial cooperation in the resolution of jurisdictional conflicts over Alberta water resources.

In addressing this issue, a respondent from the Department of External Affairs, Ottawa, observes that, "It is difficult to envision the development of good policy or regulations without constant cooperation between the federal and provincial governments."

In the negotiation and implementation of international trading agreements in the diversion, pricing and sale of water resources, originating in Alberta "It would seem reasonable to expect such ventures, if considered, to involve both orders of government."

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Furthermore, potential does exist for federal-provincial cooperation in the resolution of

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from correspondence with V.L. Kunce,
Edmonton: Special Projects Officer,
Alberta Public Safety Services. (1986).

> issues related to comprehensive water resources management "Particularly in areas where other provinces or the U.S. government are debating with the provincial government."[261]

At the provincial level, federal-provincial cooperation in negotiation at the international level, appears to be received with considerable scepticism.

> In response to an inquiry into whether the provincial or federal governments would be able to competently negotiate and implement international trading agreements in the diversion, pricing and sale of water resources, originating in Alberta, the respondent from Alberta Environment indicated "No. The record on negotiating acid rain and waste dump site cleanup does not inspire confidence."[262]

The Alberta government's stance on water export clarified by the government's response to the Pearse Inquiry's recommendations that "The federal government should pass legislation to require anyone who proposes to export water to obtain a licence. This legislation should identify the matters that will be taken into account in considering a licence application.

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[261] from correspondence with R. Lawford,
Ottawa: Manager of Programs,
Ministry of State for Science and Technology. (1986).

[262] from correspondence with M. Houston,
Edmonton: Evaluation Engineer, Dam Safety Branch,
Alberta Environment. (1986).

The Cabinet should determine whether the government is prepared to consider large scale diversions of water to the United States and, if so, the criteria that must be met for approval of proposals."[263]

In response, the Alberta government states that; "These recommendations do not apply to Alberta. One of Alberta's Water Resource Management Principles states that "Alberta will not be party to any undertaking for the possible export of water beyond Canadian borders. The priority of water use and allocation is based firstly on provincial, secondly on interprovincial and finally on national considerations, and will not be influenced by international considerations" (Water Resources Management Principles for Alberta, Alberta Environment)."[264]

The economics of water export and the political climate of the government administering the water resources will ultimately determine the success of any form of foreign market development.

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[263] P.H. Pearse, F. Bertrand, J.W. MacLaren, Currents of Change Final Report - Inquiry on Federal Water Policy. Ottawa: Government of Canada. (1985). Page 131.

[264] Alberta Environment, Submission of the Alberta Government with respect to the Final Report - Inquiry on Federal Water Policy. Edmonton: Alberta Government. (1986). Page 18.

4.1.7 INTERNATIONAL RELATIONS DEVELOPMENT

All international trading agreements fall within federal authority. The Province of Alberta could examine various proposals for diversion or sale of water originating in Alberta, however an international agreement would have to be negotiated and signed by the federal government."

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A concurring statement has been expressed by a respondent from Agriculture Canada in which:

"The federal government should take the lead in negotiations (to provide uniformity in establishing guidelines, agreements, and regulations) but the provincial governments concerned should play prominent roles in discussions and decision making."

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from correspondence with J. Carson,
Ottawa: Respondent, Department of External Affairs. (1986).

266

from correspondence with C.W. Lindwall,
Lethbridge: Head, Soil Science Section,
Research Branch, Agriculture Canada. (1986).

4.1.8 FREE TRADE AGREEMENT

Within this context, the Free Trade Agreement FTA), currently under discussion, has already raised the concerns of provincial government that federal incursions may occur into the realm of provincial jurisdictions. Within the water sector, the primary thrust in international development will probably result from the development fostered by the FTA with the United States, and thereby indirectly impact upon the state of Alberta water resources.

Subject to Senate passage, "The Agreement will:

- ensure our industries can grow from their Canadian base;
- encourage new investment in world-class Canadian enterprise;
- create a more stable and certain framework for cooperative relations between Canada and the United States; and
- set a bilateral precedent for global action.

This Agreement will give us improved and more secure access to the world's largest market. It will encourage Canadian producers to improve their competitiveness and give them a market large enough to create the economies of scale and specialization necessary to be competitive in markets around the world."[267]

In order to provide a consistent frame work, the potential ramifications of the Free Trade Agreement are discussed within five of the sectors of development, identified earlier. i.e.

(i) Diversification
(ii) Balanced Regional Growth
(iii) Quality of Life
(iv) Resources Development
(v) Foreign Markets Development

DIVERSIFICATION

The intensification of industrial development in Alberta, will place increased pressure upon the existing levels of water quality and quantity that have been allocated for industrial water use. The following consequences are expected within the context of free trade and western diversification.

> "Since regional development programs are unaffected by the FTA, the Diversification fund is not threatened. In fact, diversification should be

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[267] Department of External Affairs. The Canada-U.S. Trade Agreement in Brief. Ottawa: Government of Canada. (1987).

enhanced because the industries most often targetted for western expansion are industries which benefit under free trade.

Free trade solves two traditional western economic problems - a large enough market to make manufacturing practical, and the means to attract enough capital to set up new industries.

Paying tariffs on U.S. products in order to protect Ontario industry is an historic western grievance. Simply removing tariffs is good for Western farmers and businessmen, let alone the other advantages."

268

QUALITY OF LIFE

In terms of the impact of the Free Trade Agreement on the quality of life in Canada;

"The Economic Council of Canada reviewed 36 industry sectors. Thirty were beneficiaries under the FTA, including agriculture, mining and resources, forest products, processed food and the services industry.

Six sectors could be affected negatively including

.268
from correspondence with
Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1988). Page 4.

> textiles, rubber and plastics, electric consumer products, and miscellaneous manufacturing. Several of these industries are currently in decline in Canada due to existing pressure from imported goods.
>
> Each year, 4 1/2 million Canadians change jobs. Many require assistance such as retraining, relocation or Unemployment Insurance. These programs are not threatened. Employees facing adjustment under free trade are a small part of the labour adjustment occurring naturally.
>
> There is an adjustment challenge. But it will be a positive experience. It's like entering a fitness program. You feel much better at the end.
>
> - Murray Smith, Director of International
> Economics
> Institute of Research and Public Policy"

269

Of the thirty-six sectors of industry reviewed by Economic Council of Canada, the majority of the water-based sectors appear to have a favourable impact forecast under the conditions of the Free Trade Agreement.

269
from correspondence with
Murray Dorin, M.P., Ottawa: Member of Parliament,
Government of Canada. (1988). Page 4.

BALANCED REGIONAL GROWTH

The primary impact of the Free Trade Agreement in any of the water-based sectors may be expected in Agriculture;

In the agriculture sector, "Canadians will benefit from a more open environment for trade in farm products. All agricultural tariffs will be eliminated over 10 years, although Canada will be able to cushion domestic producers of fresh fruits and vegetables in times of depressed prices. Beef exports between the two countries will be exempt from restrictions, ensuring that Canadian beef and veal has year-round access to the U.S. market. No export subsidies will be permitted on trade in agricultural products between Canada and the U.S. Canada will also be exempt from any U.S. restrictions affecting products containing 10 percent or less sweetener, a measure of great importance to the Canadian food-processing industry.

The Agreement does not affect the right of federal and provincial governments to protect and stabilize farm incomes. The existence of farm marketing boards for grains, dairy, poultry and egg

> industries, as well as Canada's right to establish new boards, will not be affected by free trade. Canada's farmers will make real gains. Those agricultural and food products that Canadians produce in abundance - meat and livestock, grains, oilseeds and potatoes - will compete on an equal footing with U.S. products in the huge American market."

[270]

The U.S. is Alberta's biggest market for agricultural and food products, totalling $372 million in 1986, or one-quarter of our total agricultural exports. We now have duty-free access to that market for the major export products (meat, livestock, grains, oilseeds). Tariffs will be phased out over 10 years (20 years for fruit and vegetables). Supply-managed sectors (dairy, poultry) are largely unaffected. Marketing Boards remain, new ones can be created, and Canada retains the right to add products to an import-control list.
The big impact will be on Alberta's ability to manufacture raw produce into food products - creating jobs here in food processing, packaging and marketing.The U.S. will drop its tariffs and non-tarrif restrictions against Canadian food products.

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[270] Department of External Affairs.
The Canadian-U.S. Trade Agreement in Brief.
Ottawa: Government of Canada. (1987). Pages 8-9.

> "If we can remove all the uncertainty, it will pave the way for more beef products rather than live cattle.
>
> - Dennis Laycraft,
>
> General Manager, Alberta Cattle Commission." 271

We also obtained relief from American grain subsidies which have hurt Canadian grain exports. Direct export subsidies will be prohibited on Canada-U.S. trade. Both countries agree to take into account the export markets of the other before applying subsidies.

> "The Association believes that the deal will increase prospects for grain and oilseed movement to the United States and ensure that continuation of its important domestic feed market. The deal may also serve as a positive indicator for the multilateral negotiations as both sides have committed themselves to subsidy reductions at that time.
>
> - Western Canadian Wheat Growers Association." 272

Expansion is also expected in the water-intensive energy development sector. In the energy sector, "Two basic

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[271] From correspondence with Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1986). Page 5.

[272] from correspondence with Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1988) Page 6.

ideas underlie the energy section of the Agreement: Canada will be a reliable supplier if the United States is a reliable customer and both countries will share their energy supplies in the event of an energy shortage.

> This is not a new idea. It builds on our longstanding commitment made through the International Energy Agency - a commitment based on the reality of interdependence and the disastrous global consequences of energy shortages.
>
> In light of this interdependence, the United States has agreed to end embargoes against Canadian uranium exports; not to impose tariffs or other restrictions on the flow of Canadian energy; and to allow Canadian access to Alaskan oil. The Agreement will provide an environment for greater expansion and security of energy exports to the U.S."

273

> "We have 607 years of oil in the tar sands but it's costly. Unless investors are certain of future buyers, that oil will stay in the ground. The FTA promises that oil and gas will have stable, long term markets. That's a good investment which means jobs in Alberta.

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[273] Department of External Affairs.
The Canadian U.S. Trade Agreement in Brief.
Ottawa: Government of Canada. (1987). Pages 9-10.

> Free trade will clearly motivate additional exploration and stimulate interest in natural gas development, our frontiers and in our oil sands projects. These long lead-time projects must be confident of access to markets if they are to go forward.
>
> - Murray Todd, Chairman of I.P.A.C.

> We lost no sovereignty. Programs to promote exploration remain. Our regulations, conservation practices, control of development, all remain totally up to us. Canadian ownership goals are unaffected.
>
> As part of the International Energy Agency (IEA), Canada agreed in 1974 to pool energy with other industrialized nations during emergency shortages. We reaffirmed that commitment in the Free Trade Agreement. There is no obligation to fulfill foreign contracts before making energy supplies available to Canadians.

Naturally energy (including hydro electric) will be more plentiful because secure markets make energy a good investment. Our buffer against future shortages is the commitment to develop supplies today. In fact, increased electricity exports from Quebec to the U.S. could completely eliminate their reliance on the Persian Gulf, dramatically reducing the possibility of shortage.

Investor confidence in the Canadian energy

industry was destroyed by the NEP and we
are now seeing it being rebuilt.
- Bob Lamond, President,
- Czar Resources Ltd."

[274]

RESOURCES DEVELOPMENT

Greater intensification of development in the water-based agricultural and industrial sectors are forecast under the Free Trade Agreement, "All parties agree that Canada should continue to work through GATT, toward the world-wide liberalization of trade. At the current round, in Uruguay, Canada is seeking improved market access for:

- agricultural and food products.
- other natural resource products;
- energy based industries, equipment and services;
- advanced-technology and transportation equipment;
- trade in services."

[275]

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[274] from correspondence with Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1988). Page 5.

[275] from correspondence with

FOREIGN MARKETS DEVELOPMENT

Apart from the direct economic and social impacts that are expected to result from the Free Trade Agreement, "The biggest problem in our trading relationship with the United States isn't U.S. trade law. It is who decides that law, and how special interest and political protectionist pressure is applied."

276

In terms of Free Trade,
"The terms of water export should not include Canadian subsidies in the form of ignored environmental, social and opportunity costs or direct payments for secondary benefits. Environmental costs can be high but if damage can be kept to a minimum and at least compensating enhancement can be provided - e.g. in strong support of programs such as the North American Waterfowl Management Plan (Environment Canada,

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Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1988). Page 6.

[276] from correspondence with
Murray Dorin, M.P., Ottawa: Member of Parliament, Government of Canada. (1988). Page 16.

1985) - the objections of most environmentalists can be met. Canadian control of development in Canada probably with water sales at the border, is necessary. Specific water rights should not be committed and transfers may be sequential from farther and farther north at increasing cost so that water prices in southern Canada for Canadians needs not be inflated by competition. In some situations, Canadians may be assessed for some of the scale economies if they use some of the transferred water. Contracts must be for sufficiently long terms at high enough prices that development and other costs may be recovered.

Prices of water at the border should cover all costs and provide some profit yet mutual benefit with the United States is necessary if ill-feeling is to be avoided. Price flexibility, to cover inflation etc., is needed, the alternative would be to charge prohibitively high fixed prices to cover the eventuality of cost increases. Price flexibility is possible with continuing negotiation if both parties have the power to reduce deliveries by e.g. 25 percent per decade; Canada because of inadequate revenues and the United States because of prices regarded as being excessively high, perhaps relative to alternative supplies from desalination or other sources and an acceptance of reduction in agricultural use as local supplies run out. The assurance of replacement supply, especially if accompanied by construction, is worthy of significant charge. It can be a basis for planning and investment, not otherwise available, for individuals, companies and various levels of government long before transfer takes place.

We have abundant supplies in many parts of Canada (over twenty-five times the per capita supply in conterminous United States - Laycock, 1987) and some commitments could be made after careful study if the contract prices are high enough. Apparent markets might quickly vanish when prices become known, but at some point in time, perhaps many decades in the future for irrigation but perhaps very soon for other and combined uses, some exports will become viable. A lead time for organized research, discussion and planning is needed.

Water export has been said, by many observers (e.g. Thompson, 1987), to be irreversible because communities would become dependent upon it and political pressures for continuation would be too strong to resist. The exporting country would have similar dependencies because abandonment of massive investment and revenues involved could be traumatic. If either country felt that the risks,

> closeness of ties and commitments involved were excessive, the initial agreements should be avoided. The hazards are great, but so are the opportunities. Negotiation must be extremely sensitive and there must be continuing flexibility. Water export should be negotiated on its merits. It must not be a pawn in a larger trade package that might rigidly commit us to an undervalued waste of our resources."

277

The Agreement provides for a unique means of resolving trade disputes. A panel with Representation from Canada and the United States will act as a final "court of appeal", with binding powers to ensure the fair and impartial application of anti-dumping and countervailing duties. The panel will have the power to overturn decisions if it finds that national laws have been improperly or unfairly applied. This will ensure that the rule of law - not political power - governs the trade process.

> Yet the Agreement goes further, Canada and the U.S. have agreed to negotiate new rules to govern our trading relationship. These rules would take effect by 1993, five years after the Agreement takes effect."

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[277] A.H. Laycock, "Free Trade and Water Export," Canadian Water Resources Journal/Volume 12, No. 3, 1987. Kingston: Canadian Water Resources Association. (1987). Editorial.

[278] The Free Trade Agreement thus has the potential to generate mechanisms for dispute settlement. The successful implementation of such mechanisms in the resolution such transboundary issues as acid rain and water export could have a significant impact on the future mechanisms and structures in the development of water resources in Alberta.

In addressing the full range of ramifications that could result from such agreements in the international arena, the CCREM Task Force on the Environment and Economy generated several recommendations designed to lead toward global integration of environment and development planning. These recommendations have particular application in the water resources development sector.

> "To continue and strengthen Canada's role in the international movement to integrate environmental protection and economic development, the Task Force makes the following recommendations:
>
> - Canada should show leadership in the development of international programs by carrying out projects which demonstrate the environmental - economy link. (for example, projects on forest, water or soil management; effects of climate

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[278] Department of External Affairs.
The Canada-U.S. Trade Agreement in Brief.
Ottawa: Government of Canada. (1987). Page 4.

change.)

- In the global discussion on sustainable development initiated by the report of the World Commission on Environment and Development, Canada should share its experiences with the world community on how to integrate environmental and economic precision making.
- Canada should explore and promote mechanisms to ensure that environmentally sound economic development is an important component in international discussions and negotiations dealing with development and trade. Canada should also ensure that each international development project in which it participates is environmentally and economically sustainable.
- Canada should ensure that its representatives on multilateral development bodies strive to have environmental and economic sustainability built into the policies and procedures of these organizations.
- Canada should provide support to the recommendations of the World Commission on Environment and Development and that there be a United National Global Conference on environment and development."

279

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[279] Canadian Council of Resource and Environment Ministers.

Such mechanisms could contribute greatly to the fostering of cordial international relations in the environmental and economic development of Canadian water resources. The resolution of many of these international water resources development issues, through this form of structure, could lighten the burden of stress that is placed upon existing federal-provincial structures currently attempting to resolve these forms of issues.

Report of the Task Force on the Environment and Economy.
Ottawa: Government of Canada (1987). Pages 14-15.

4.1.9 CONCLUSIONS

Unlimited potential appears to exist in the application of cooperative Federal-Provincial Programs in the management of Alberta Water Resources. The impetus to strive for more effective policies and strategies in the management of Alberta water resources also appears to exist at the Departmental level. Serious limitations, however, are encountered at the inter-departmental level. Conflicting priorites in water resources development is one fundamental and striking example of an important obstacle in generating consistent water management strategies. As a result of inconsistent priorities in water management, priority inconsistences are carried to the policy, program development and program implementation levels.

Generally consistent water management priorities have the potential to result in water management programs that are focussed into the same group of sectors for water resources development.

In instances where this form of development in water management programs has resulted in federal and provincial programs operating in the same sector; federal-provincial cooperation has generally resulted within the course of the respective programs. Such cooperation appears to occur with or without a formal cooperative federal-provincial agreement.

The existing cooperation between the PFRA and the provincial departments of Environment, Agriculture, Transportation and utilities and Forestry, Lands and Wilflife, in the administration of the Alberta Water Supplies Assistance Program (1988), provides an example of federal-provincial cooperation outside of a formal cooperative agreement. The longstanding record of programs conducted by the PFRA in Alberta has undoubtedly helped to foster this degree of federal-provincial cooperation.

This example unfortunately does not typify the state of federal-provincial cooperative relations on water resources development in Alberta. In order to facilitate consistency in water resources priorities at the departmental level and thereby promote the potential for consistency in programs development, consideration should be given to establishing a non-legislative federal provincial directorate. This directorate could parallel the structure of an expanded version of the Water Management Resources Committee (WMRC) proposed in the Nielsen Report (1985, p 274). The mandate of such a directorate would be to establish general consistency in water resources development priorities amongst federal and provincial agencies in the water resources development sectors. The objective of the mandate would be to assess, coordinate and maximize the degree of federal-provincial cooperation in the delivery of water resources programs in Alberta.

5.0 THE EFFECTIVE ROLE OF FEDERAL-PROVINCIAL PROGRAMS WITHIN THE MANAGEMENT OF ALBERTA WATER RESOURCES:

5.1 INTRODUCTION

> "Federal-provincial consultations on matters of mutual concern have been on-going since confederation and there is no reason to believe this will change. The mechanics of this process have been and will continue to be refined as needs dictate."

[280]

Jurisdictional conflicts and intergovernmental disputes over issues in water management have long plagued federal-provincial efforts. In 1970, the Canada Water Act was enacted and partially addressed these problems. Federal-provincial agreements, in place before 1970, continued following the enactment of the Act.

The lead federal agency for programs under the Canada Water Act has been Environment Canada, although several federal-provincial agreements have been concluded with other federal agencies. These agencies include the

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[280] from correspondence with V.L. Kunce, Edmonton: Special Projects Officer, Alberta Public Safety Services. (1986).

Department of Agriculture Canada, the now defunct Department of Regional Industrial Expansion, and its predecessor the Department of Regional Economic Expansion, Fisheries and Oceans, National Health and Welfare, Central Mortgage and Housing Corporation, the Ministry of Transport, the Department of Indian Affairs and Northern Development and the Department of Public Works.

> With this multidisciplinary forum, research in water management alternatives "Should be encouraged to develop practical and viable alternatives" in improving the level of federal-provincial cooperation.

[281]

> Research in generating water management alternatives "would likely be productive, but public pressure (to do so), is unlikely for some time."

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[281] from correspondence with
Dr. C. Ko, Ph.D., P.Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[282] from correspondence with
C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

5.2 FEDERAL-PROVINCIAL PROGRAM PARTICIPATION

> "The abundance of Canada's water supplies has been a prime factor in shaping public attitudes and federal and provincial policies. Despite rapid growth in economic and social needs, technological developments and new environmental requirements generations of Canadians have felt free to use and abuse their water resources as the result of low pricing. (Canada's per capita use is now among the highest in the world and the prices charged for it are among the lowest.)
>
> Governments must go beyond the symptons to the causes of the problems and take new approaches with the changing realities in mind. New mechanisms are required to protect the resource and allocate diminishing water supplies among increasing and competing uses. This policy has been developed in a manner consistent with other federal policy objectives, including fiscal restraint and public health. The most effective mechanism for realizing this policy lies in developing anticipatory and preventive approaches to managing the quality and quantity of Canada's water resources in a way that acknowledges their value in social, economic and

environmental terms."[283]

Since the enactment of the Canada Water Act, about fifty five federal-provincial agreements relating to various water management issues have been concluded across Canada. During this period, five preplanning studies were also conducted without agreements.

These programs may be classified under three categories: planning and implementation programs, regulation and data collection programs, and flood damage reduction programs. Firstly, the planning and implementation programs focus upon planning studies and implementation agreements. Regulation and data collection programs deal with regulation and apportionment, inventories, surveys and monitoring of water resources. The third category, flood damage reduction programs has been divided into 'project-specific' and 'province-wide' program formats. In this manner the program addresses the long term and more general province wide issues of flood damage reduction on a different time frame than the often more urgent flood reduction response, during period of actual flooding.

On average the provinces have been involved in at least two or more agreements during the course of any one year. The provinces of British Columbia, Saskatchewan,

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[283] Environment Canada. Federal Water Policy. Ottawa: Government of Canada. (1987). Page 1.

Manitoba, Ontario and Quebec have at times each been involved in as many as five federal-provincial programs relating to water management. With the exception of Prince Edward Island; Alberta ranks lowest in the level of participation by the provinces in agreements under the Canada Water Act.

> With greater federal government involvement in management of Alberta water resources through participation in federal-provincial cooperative programs, the "major benefits to be achieved are that:
>
> - federal representatives could provide a neutral arbitrator to assist in resolving debates;
> - federal participation would ensure that national concerns were taken into consideration and that federal sources of revenues were not exploited;
> - access to the federal research programs and more effective input to federal priorities."

[284]

Further to this development, a concentration on the development of an improved mechanism for Federal-Provincial cooperative programs would result in such benefits as:

(i) improved "national consistency"

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[284] from correspondence with
R. Lawford, Ottawa: Manager of Programs, Ministry of State for Science and Technology. (1986).

[285]

(ii) the "efficient use of information networks;"

[286]

(iii) the resource of "wider experience to draw on;"

[287]

(iv) the bargaining potential of "international clout."

[288]

Alternately, Inter-Provincial programs offer conditions under which:

(i) There are "fewer players;"

[289]

(ii) agendas generally have "more focussed attention on specific issues;"

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[285] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

[286] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

[287] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

[288] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Ananlysis. (1986).

[289] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

[290]

In the perceptions of a respondent for the International Institute for Applied Systems Analysis, (Austria), a collaborative effort is required in order to fully address the range of concerns raised by the process of comprehensive water resources management. Scientific and Economic Institutions are required to provide the developmental and strategic techniques for policy implementation. The primary role of the Federal Government is in the provision of guidelines for national objectives for water quality and quantity. These guidelines should be developed in consultation with the Provincial government. The primary role of the Provincial government in this process would be to manage the decision-making process for the developments and interventions. Industry, as a whole, would support this process through the provision of 'technological knowhow.'

[291]

One respondent from Alberta Environment indicated that a further benefit to be gained from participation in cooperative federal-provincial programs in water management is the 'avoidance of the unnecessary duplication' in research and programs.[292]

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[290] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

[291] from correspondence with
Dr. C. Miller, Schloss, Laxenburg, Austria: Research Scholar, International Institute for Applied Systems Analysis. (1986).

In a somewhat conflicting statement, a second respondent from Alberta Environment indicates that; "The only advantages of the federal government (involvement in cooperative federal-provincial programs) are funding and possibly negotiating with native groups."[293]

The perceptable cynicism expressed in this statement is not necessarily reflected at all levels of management, within Alberta Environment. "The Government of Alberta believes that the most efficient and effective method of managing interjurisdictional waters is through the establishment of intergovernmental water management boards. Alberta is a strong supporter of the "most useful model" for such institutions - the Prairie Provinces Water Board. As the Pearse report points out, the Prairie Provinces Water Board has worked effectively in administering Canada's only formal interprovincial water apportionment agreement. Institutions of this sort should remain the focus of interjurisdictional coordination and cooperation.

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[292] from correspondence with
Dr. C. Ko, Ph.D., P. Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[293] from correspondence with
M. Houston, Edmonton: Evaluation Engineer, Dam Safety Branch, Alberta Environment. (1986).

> We also agree with the intent of the Inquiry's recommendation concerning establishment of arbitration boards to resolve disputes among jurisdictions where other efforts have failed. Arbitration procedures, however, must be viewed as an adjunct to, and not a replacement for, intergovernmental management boards.
>
> Should there be general agreement to proceed to establish a mechanism for arbitration, our preferred approach would be to have such mechanisms specifically addressed in federal/provincial agreements concerning interjurisdictional streams. At this time we cannot support placing arbitration provisions in the Canada Water Act."
> [294]

In response to the full range of issues raised in the comprehensive management of Alberta water resources; the respondent for the Design and Implementation Division of Alberta Recreation and Parks indicated that a preferable structure would include "A combination of agencies and government departments. In the Provincial government, likely Alberta Environment, Alberta Energy and Natural Resources, Energy Resources

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[294] from correspondence with Walter Solodzuk, P. Eng., Edmonton: Office of the Deputy Minister, Alberta Environment. (1986).

Conservation Board, Water Resources Commission, Alberta Executive Council."

295

In the Report of the National Task Force on Environment and Economy, the complete integration of the environmental and economic issues is advocated by the Canadian Council of Resource and Environment Ministers, as a general resource strategy.

> "Our main objective is to promote environmentally sound economic growth and development, not to promote either economic growth or environmental protection in isolation. Complete integration of the environment and the economy would be a tall order in any country; it is made no easier by the complexities of the Canadian mosaic. We believe, however, that such integration is possible. In fact, we believe that it is absolutely necessary. With goodwill, leadership and new processes for decision making and planning, we can meet our responsibility to future Canadians by managing carefully and protecting the resources we hold in trust for them.

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[295] from correspondence with
[illegible]. Kohler, Engineer, Alberta Recreation and Parks
on behalf of:
D.[illegible]. Cline, Edmonton: Assistant Deputy Minister, Design and Implementation Division, Alberta Recreation and Parks. (1986).

> Long term economic growth depends on a healthy environment. It also affects the environment in many ways. Ensuring environmentally sound and sustainable economic development requires the technology and wealth that is generated by continued economic growth. Economic and environmental planning and management must therefore be integrated."

296

The perceived short and long-term benefits to federal-provincial program participation in water resources management have been realized and expressed in the forms of objectives and policy statements. The critical link and obstacle is to create a universally acceptable, flexible structure or consultative mechanism in which these objectives and policies may be interpretted as programs.

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[296] Canadian Council of Resource and Environment Ministers. Report of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Page 2.

5.3 FEDERAL-PROVINCIAL PROGRAM STRUCTURES

In addressing the issues of federal-provincial program structures in the implementation of completely integrated environmental and economic resources planning, the Canadian Council of Resource and Environment Ministers recognized that;

> "These ideals cannot easily be put into practice through political, social and economic structures which have been designed for other purposes. The principles of shared responsibility and integrated decision making must become the foundation for our institutions and guide our key decision makers. One of the most important of our recommendations proposes a new co-operative initiative to integrate economic and environmental planning through the participation and debate of senior decision makers in every province and territory and at the national level in Canada. We have called for the creation of Round Tables on environment and economy, to provide a forum for these decision makers to work towards a consensus on this fundamental issue.
>
> We give support to the development of "conservation strategies" in every Candadian jurisdiction. Our primary interest in such strategies is to use them

as a basis for development which ensures that the utilization of resources today does not damage the prospects of future generations for maintaining or improving their use. We are convinced that the problems of the past can largely be avoided by making use of the technologies and knowledge that we already possess or are now developing. We, therefore, recommend the development of conservation strategies as a valuable multi-sectoral approach to defining and implementing sustainable economic development.

We have made specific recommendations to explore tools and techniques which can assist all of us to better understand the linkages between the environment and the economy. In this way it will be increasingly possible to provide incentive systems which lead more systematically to economically and environmentally sound development.

Given the recognition that environmental considerations are essential to social and economic planning, Canada's cabinet chambers and boardrooms must assume new responsibilities. We have made recommendations on leadership in government and industry which reflect and reinforce these responsibilities. We have also recognized the leadership role played by non-government organizations with respect to the early

> identification and public debate on environmental issues."[297]

In attempting to generate alternative structures in the programs that are used in managing water resources, the Science Council of Canada examines the state of the Canadian water science and the organization of research.

> "Many different federal and provincial departments and agencies are involved in water research, or in the use of research findings, as well as municipal governments, private firms, international bodies and the general public. The diversity of actors complicates analysis.
>
> Federal government departments involved include Environment, Fisheries and Oceans, Agriculture, Transport, Communications, External Affairs, Health and Welfare, Indian and Northern Affairs and Energy, Mines and Resources. Environment Canada administers the Canadian Centre for Inland Waters, the National Research Institute and the National Hydrology Research Institute. Fisheries and Oceans administers the Freshwater Institute...other federal bodies involved include the International Joint Commission and the National Research Council as well as the major granting councils, especially

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[297] Canadian Council of Resource and Environment Ministers. Report of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Page 2.

the Natural Science and Engineering Research Council.

At the provincial level, key responsibility for water rests with departments of Environment, Natural Resources and Agriculture. Most Universities are involved in some water related research.

Among the most evident, and most serious, unresolved research issues facing Canadians are:

(i) the transport of acidic and toxic substances from the atmosphere into water bodies; the effects of such substances on aquatic systems and fitness of water for various uses; and volitilization of toxic substances from lakes and river to the atmosphere and their subsequent dispersion;

(ii) the changes in water supply, which will probably be brought about by air pollution - induced climatic warming, and options for adaption or responses to such changes;

(iii) the movement of toxic chemicals into groundwater from dump sites and underground storage and disposal sites; non-point sources of chemicals used in agriculture and forestry, and their impact on water supplies and uses; and the location of "safe" underground disposal sites for toxic and radioactive wastes;

(iv) the determination of the future economic and social value of water near its place of origin and in-channel, and the need to give proper weight to this in considering projects to withdraw or divert water;

(v) the effects on aquatic ecosystems of increased ultraviolet radiation due to ozone depletion;

(vi) the relations between fresh water and the marine environment;

(vii) mechanisms for resolving conflicts between competing users;

(viii) the economic effects of diversions of water both from one river basin to another and out of one ocean drainage basin into another;

(ix) the ultimate fate and impacts of low level of toxic chemicals discharged into the environment.

These issues all have two characteristics in common: they require an interdisciplinary approach to water research, to water policy development, and to implementation; and they are international in scope."
298

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[298] Science Council of Canada. Water 2020: Sustainable Use for

"Since water should be considered as a national resource, federal-provincial programs should ensure that benefits and responsibilities are shared by Canada as a whole."

299

The Science Council of Canada recognizes that:

"Even if politically acceptable, traditional solutions to problems of water supply will be difficult and costly to implement. A change in water use practices is inescapable in the face of evidence of increasing ecological damage, the cost of maintaining the existing supply system, and the need for careful husbandry of resources to ensure a sustainable economy.

Science and technology are powerful tools to help secure our goals....But the chronic, complex and global problems that face our water resources are quite different from the relatively simple, acute, localized problems of the past. Their resolution requires a national commitment to align the actors in a common purpose and a number of important changes to realign our resources for science and

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the 21st Century. Ottawa: Government of Canada. (1988). Pages 17-18.

[299] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

technology. In brief:

- the federal government must implement its commitment to Canadian leadership in water science;
- institutional changes must be made to ensure that necessary research is put in place now to tackle future problems;
- the fragmented water community must be encouraged to come together in a concerted effort to resolve water use problems;
- Canada must capitalize on its reputation and expertise in water science to meet global needs;
- the results of water research must be commercialized to promote economic growth in a healthy environment."[300]

Under the Canada Water Act, the structure of the federal-provincial agreements that result are generally of two varieties. The first type is the province wide agreement. These agreements typically address a wide range of water-based issues representing the province as a whole. Such agreements often involved Environment Canada as well as several other federal government agencies. Environment Canada's sponsorship centres around water quantity surveys, and the Flood Damage

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[300] Science Council of Canada. Water 2020: Sustainable Use for the 21st Century. Ottawa: Government of Canada. (1988) Page 33.

Reduction Program, of which Alberta is not a participant. The Prairie Farm Rehabilitation Program is one of the active agreements which involves the sponsorship of several other federal government agencies in water management.

The structure of the second type of agreement pertains to specific river basins, sub basins or individual water bodies.

> In the management of such River Basin agreements a "Review of existing requirements and planning future development in a logical and organized way is the most important issue."

301

In these programs, Environment Canada serves as the sole federal government lead agency. There are two sub-types to these agreements. The first sub-type is oriented to specific issues while Comprehensive River Basin planning and implementation is addressed in the second sub-type.

Agreements of the first sub-type variety normally arise from conflicts over use of a specific water resource within a river basin. In contrast, strategies in multiple use of water resources a river basin scale are the typical conclusions of comprehensive River Basin Planning and Implementation Agreements. The second

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[301] from correspondence with D. Roberts, Calgary: Project Manager, Acres Internation Ltd. (1986).

sub-type thus raises a broad range of water management issues in Alberta.

> "Any type of development should necessarily fit into a national approach. The federal government is automatically involved where there is a water course crossing a provincial (or international) boundary."[302]

Ostensibly under the *Canada Water Act*, the federal government has been enabled to enter into a series of different agreements with the provinces for water related planning and implementation. Under the Act, these programs may be entered into with respect to any waters where there is significant national interest in the water resource management thereof. The purposes, as stated by the *Act*, are to formulate comprehensive water resource management plans, based upon an examination of the full range of reasonable alternatives and taking into account views expressed at public hearings and otherwise by persons likely to be affected by implementation of the plans. These agreements are also to permit the project design for the efficient conservation, development and utilization of those waters. The *Act* also grants joint commission boards or other bodies the powers to direct, supervise and coordinate such programs.

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[302] from correspondence with G. Gorrell, Edmonton: Director, Agriculture Canada. (1986).

At the time that the Act was enacted, it was envisioned that this form of comprehensive river basin planning would form the core of federal-provincial cooperation in water management ventures. As stated in a policy statement by the Inland Water Directorate of 1978; joint cost-shared federal-provincial river basin studies are recognized as the primary means of planning for multipurpose water use, and public participation is considered to be an integral and vital part of such studies. Further to this statement was the fact that the federal government would not provide funds for the implementation of water programs unless it had first participated in the planning of these programs, or had satisfied itself that the national aspects had been given full consideration.

> A respondent from the Federal-Provincial Relations Office of Environment Canada acknowledges that "to some extent",
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> [303]
>
> potential does exist for Federal-Provincial cooperation in the resolution of some of the issues and limitations, identified in these Federal-Provincial program structures.

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[303] from correspondence with M. Proctor-Twigg, Respondent, Federal-Provincial Relations, Environment Canada. (1986).

> "An independent elected provincial water board with federal counterpart"...[304]

> is suggested as an alternative structure, most capable of addressing the full range of concerns raised by the process of forged comprehensive federal-provincial agreements in water management. Alternately, "Other Provincial governments should be included on Boards dealing with federal-provincial programs, but their involvement should not be at the expense of federal involvement (i.e. not as an alternative to federal-provincial programs)."[305]

The Round Table approach is an alternative structure that may be applied in federal-provincial programs. This approach was proposed in a recent Task Force on the Environment and the Economy and is designed to provide an open and integrated process in environmental and economic development of Canadian resources. This process is particularly applicable to the development of Alberta water resources.

Recommendations "To create a permanent forum in which all sectors can meet to co-operate on preventive strategies and to influence planning have been suggested by the Task Force in the following:

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[304] from correspondence with M. Proctor-Twigg, Respondent, Federal-Provincial Relations, Environment Canada. (1986).

[305] from correspondence with R. Lawford, Ottawa: Manager of Programs, Ministry of State for Science and Technology. (1986).

- Each province and territory should form a multi-sectoral Round Table on Environment and Economy to bring existing organizations together to co-operate on environment-economy integration at provincial and territorial levels. Members of CCREM, in consultation with cabinet colleagues, should take the initiative to form the Round Tables. The Chairperson of each Round Table should be appointed by and report to the First Minister of the Jurisdiction in which it is formed. The Round Tables should be fully operational in every province and territory by September 1988.

Of all our recommendations, we consider Round Tables to be among the most important. Their implementation and success are fundamental to the achievement of environmentally sound economic development in Canada.

- Concurrent with the formation of provincial and territorial Round Tables, a national Round Table should be formed from representatives of these Round Tables, with additional members added from the federal cabinet and national non-government

> organizations, labour, academic and business associations as appropriate. The Chairman of the national Round Table should be apppointed and report to the Prime Minister."[306]

Alternative structures and proposals for various forms of consultative mechanisms do exist. Fostering the 'political will' to deal with and overcome the frustrations in resolving the inconsistencies in priorities and policies, within and between departments at the federal and provincial levels of government, is an interagency activity that cannot be overestimated.

Establishing a forum or consultative mechanism to deal strictly with the resolution of inconsistencies in priorities and policies in water resources management could be instrumental in markedly improving the level of federal-provincial program effectiveness in the management of Alberta water resources.

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[306] Canadian Council of Resource and Environment Ministers. of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Page 10-11.

5.4 FEDERAL-PROVINCIAL PROGRAM EFFECTIVENESS IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

In order the ensure the effective implementation of federal-provincial programs, several factors require ongoing consideration. As identified by the Task Force on the Environment and Economy the development of effective and co-ordinated conservation strategies across Canada is of prime importance.

> "Provincial and territorial governments should assume responsibility for the co-ordination and development of conservation strategies in their jurisdictions;
>
> - CCREM, in consultation with industry and non-government organizations, should prepare a compendium of Canadian experiences in developing conservation strategies by September 1988. The compendium will aid jurisdictions in working out procedures and protocols for the development and integration of conservation strategies.
> - In the next two years, provincial and territorial governments should organize workshops and seminars on conservation strategies, with progress to be reviewed on a major National Conference on Sustainable Development in 1989 and

1990.

- Every province and territory should have a conservation strategy in place by 1992. A national strategy should be prepared which integrates the provincial and territorial strategies and links them to the international scene. This work should be presented by Canada at the U.N. Global Conference on Environment and Development proposed by the World Commission on Environment and Development.
- Non-government organizations and industry should:
  - Participate in the planning, design and implementation of the public involvement component of developing conservation strategies;
  - Conduct and participate in workshops, seminars and annual meetings focussing on components of the conservation strategy appropriate to their organization.
  - Be prepared to develop briefs or discussion papers about specific aspects of sustainable development, as part of policy development processes;
  - Provide assistance and advice regarding the co-ordination and integration of resource management across sectors and political jurisdictions."

[307] In responding to the effectiveness of federal-provincial programs in the management of Alberta water resources, a respondent for Alberta Forestry indicated that neighbouring provincial governments should be included in cooperative water management agreements, though not as an alternative to federal-provincial programs "It is important that neighbouring provincial governments be included in cooperative management agreements as they have some say in what will happen to the water that eventually reaches them."

"We don't think these are benefits to one at the expense of the other. As stated above, Alberta, and those provinces whose water is affected by water management strategies and the Federal government, should all be involved in setting policies and programs for that water which is interprovincial in scope. Water that originates and remains in Alberta is Alberta's concern only." [308]

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[307] Canadian Council of Resource and Environment Report of the Task Force on the Environment and Economy. Ottawa: Government of Canada. (1987). Pages 12-13.

[308] from correspondence with
G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources
on behalf of:
L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource

Although five joint comprehensive basin planning studies have been completed across Canada with two federal-provincial agreements in place, no such program has been undertaken in Alberta.

In the comprehensive management of Alberta water resources;

"Current problems, if any, may not be a jurisdictional matter over water rights. The problems appear (to be) due to the lack of clear definition of federal roles on water issues."
309

Furthermore, Cooperative federal-provincial regional planning commissions do have a role to play in the comprehensive management of Alberta water resources, "provided such roles are clearly defined."
310

A response from one of the directors of Agriculture Canada indicates that the potential for federal-provincial cooperation, in the resolution of comprehensive water management issues, is

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Evaluation and Planning Division, Alberta Forestry. (1986).

[309] from correspondence with
Dr. C. Ko, Ph.D., P.Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

[310] from correspondence with
Dr. C. Ko, Ph.D., P.Geol., Edmonton: Section Head, Resource Evaluation, Hydrogeology Branch, Alberta Environment. (1986).

already fully developed and that a continuation of the efforts and mechanisms currently in place, is in order.

"We are already cooperating on virtually all water related issues."[311]

The respondent indicated that it was "not likely" that cooperative federal-provincial regional planning commissions have a role to play in the comprehensive management of Alberta water resources. No amendment in jurisdiction over certain water rights was recommended so as to aid in the resolution of federal-provincial water management issues,

"unless the confrontations become much more serious than they are at present or the province shirks its responsbilities."[312]

Similarly, in response to an inquiry into whether cooperative federal-provincial regional planning commissions have a role to play in the comprehensive management of Alberta water resources, the respondent from Alberta Environment responded "no."[313]

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[311] from correspondence with G. Gorrell, Edmonton: Director, Agriculture Canada. (1986).

[312] from correspondence with G. Gorrell, Edmonton, Director, Agriculture Canada. (1986).

The Executive Director of the Alberta Water Resources Commission indicated that cooperative federal-provincial regional planning commissions were 'not necessary' in the comprehensive management of Alberta water resources.

"It is believed that there are existing mechanisms which can be used whenever appropriate to undertake shared program development and to deal with federal-provincial issues."[314]

Notably, contrary positions are held by respondents from several other provincial-federal government agencies.

In an exhaustive response to the existing potential for federal-provincial cooperation in the resolution of comprehensive Alberta water resource management issues; a respondent from the Agriculture Sector indicated that:

"In recent years, cooperation between Alberta and Ottawa has been poor. Even in agriculture, which is probably one of the best, it could be much improved. We note with satisfaction that interprovincial committees and provincial-federal committees are now more active. But the problem goes much deeper into elimination of parallel services. For example: provincial agencies of Agriculture and Environment provide services in small water development schemes that PFRA also provides.

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[313] from correspondence with
M. Houston, Edmonton: Evaluation Engineer, Dam Safety Branch
Alberta Environment. (1986).

[314] from correspondence with
R.H. Cronkhite, Edmonton: Executive Director, Alberta Water
Resources Commission. (1986).

In our view, PFRA should withdraw entirely from this field where issues are essentially local and concentrate on larger projects, such as interprovincial and international river basin storage and control. This should include operation and maintenance of these systems in perpetuity, similar to USBR in United States.

[315]

A respondent for the Soil Science Section in the Research Branch of Agriculture Canada, advocates that cooperative federal-provincial regional planning commissions do have a role to play in the comprehensive management of Alberta water resources "since water flow is not confined by political boundaries, it should be considered as a national resource with major inputs from regional planning commissions."

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[315] from correspondence with W.J. Wankel, Lethbridge: Planning Section Head, Agriculture Centre, Provincial Government of Alberta. (1986).

316

"Often resource management issues are regional in nature. It would, however, be advisable to have policy directives at both the federal and provincial levels to guide the direction of decisions made at a regional level."

317

"A wider range of issues tend to be analysed when both levels of government are involved, with their different perspectives on the issues."

318

The role of cooperative federal-provincial regional planning commissions, in the comprehensive management of Alberta water resources, have application "particularly in the conduct of planning studies, in resolving water use conflicts, and setting the agenda for research program."

319

Consideration should also be given to the fact

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[316] from correspondence with
C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

[317] from correspondence with
J.D. McTaggart-Cowan, Ottawa: Director, Office of Environmental Affairs, Ministry of Energy, Mines and Resources. (1986).

[318] from correspondence with
R. Prach, Edmonton: Respondent, Canadian Wildlife Service, Environment Canada. (1986).

[319] from correspondence with
R. Lawford, Ottawa: Manager of Programs, Ministry of State for Science and Technology. (1986).

that:

"because many problems will not be unique to Alberta, Federal input should help prevent duplicative efforts, and provide solutions more likely to be fair to all areas concerned."[320]

In addition, cooperative federal-provincial regional planning commissions are warranted in the comprehensive management of Alberta water resources because a significant percentage of "Alberta's water resources are interprovincial. As such, Federal representation is imperative."[321]

The respondent for the Federal-Provincial Relations Office of Environment Canada concurred with the above stated views that cooperative federal-provincial regional planning commissions have a definite role in the comprehensive management of Alberta water resources.[322]

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[320] from correspondence with
C.W. Lindall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

[321] from correspondence with
G.P. Bergstrom, Head, Watershed Management Section, Forest Land Use Branch, Alberta Forest Service, Alberta Energy and Natural Resources,
on behalf of:
L.J. Cooke, Edmonton: Assistant Deputy Minister, Resource Evaluation and Planning Division, Alberta Forestry. (1986).

[322] from correspondence with

To date, implementation plans in the remaining three comprehensive basin planning studies are being concluded with Environment Canada, under such programs as the Flood Damage Reduction Program or with other federal government agencies. Exclusive agreements with the province provide a third alternative for the conclusion of the joint comprehensive basin planning studies.

Since 1975 the number of joint comprehensive basin studies has declined significantly. This decline has been attributed to the expense incurred in the planning and especially in the implementation of these programs. Generating political support was also stated as a limiting factor in the continued success of these studies.

Further obstacles encountered in the actual mechanism of the studies included the fact that the studies were too lengthy, of limited relevance, and resulted in recommendations too numerous and costly to implement. Operating in the bounds of the federal-provincial agreement made the transition from planning to implementation a slow process lacking in coordination.

As a result of this trend away from comprehensive basin planning, a greater number of issue-specified federal-provincial agreements have been concluded under the Canada Water Act, the Flood Damage Reduction

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M. Proctor-Twigg, Respondent, Federal-Provincial Relations, Environment [illegible] [illegible].

Program, the Department of Regional Economic Expansion and Canada-U.S. Agreements. This shift in interest also reflects the increased willingness on the federal government's behalf to support planning projects requested by the provincial governments.

> "It is believed the Provinces working together and negotiating as necessary is the preferable cooperative approach to handling all water issues within their jurisdiction, and, should probably be extended with the agreement of Canada to such areas as fisheries and navigation, at this stage of Canadian development."

323

The 'political will' exists to overcome the inconsistencies and frustration levels experienced within and between federal and provincial government departments, in the management of Alberta water resources.

A viable, flexible consultative mechanism or structure is required to focus this 'political will' within a non-confrontational forum, dedicated to water resources management.

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[323] from correspondence with R.H. Cronkhite, Edmonton: Executive Director, Alberta Water Resources Commission. (1986).

5.5 THE RECOMMENDATIONS AND PROBABLE RAMIFICATIONS THAT COULD RESULT FROM INITIATIVES DESIGNED TO IMPROVE THE EFFECTIVENESS OF FEDERAL-PROVINCIAL PROGRAMS IN THE MANAGEMENT OF ALBERTA WATER RESOURCES

In a recommendation put forward by Environment Canada, River Basin Planning and Basin Planning Implementation and Interprovincial programs would be merged into a program concerned with Federal-Provincial Territorial waters. Canada-U.S. transboundary related projects would then be addressed under a Canada-U.S. Program. Potential would appear to exist within the structure of the unratified Free Trade Agreement to address such transboundary issues as acid rain, although negotiations on the issue do not appear imminent. Federal government leadership in the area of comprehensive river basin planning would be of significantly lower profile.

Despite the reduced interest in the nation wide program of comprehensive river basin management at a federal level; basin programs in Alberta have been continued. As noted in the Pearse Commission, Alberta did not participate in any of the federal-provincial basin planning studies due to a general reluctance to participate in any water related federal-provincial agreements.

Alberta is, nevertheless, recognized as a leader in river basin management. However, although the basin plans have been established for the six river basins, basin plans are regarded as secondary to land use planning. There are no legal requirements to produce and implement river basin plans, whereas there are such requirements for land use plans.

Although comprehensive river basin planning has not received the profile that was originally intended at the federal level, continued federal support of these programs is desirable. During periods of fiscal constraint, programs under provincial sponsorship may face less cutbacks if federal assistance were available. Especially in the case of Alberta, modification of the federal government's role in these joint federal-provincial programs could enhance the long term working relationship between both levels of government. Alternatives would include a case-by-case assessment of programs to be undertaken, a province wide program structure or a combination of the two.

The primary modification built into a case-by-case assessment of basin planning studies, would be that these programs be initiated at the provincial level of government. The provincial government would be responsible for the project development. Requests for federal assistance would be assessed on the basis of the program's contribution to the national interests of the nation, and its priority to compete for available federal resources. This strategy has, in part, been adopted by the federal government as a result of the shift in interest from a federal comprehensive river basin planning strategy. This change in approach to project implementation has thus significantly reduced the perceived federal intrusion into provincial water management programs. Potential would therefore exist for a more relaxed atmosphere of cooperation between federal and provincial levels of government.

In order to introduce a province wide agreement in river basin planning, the above mentioned levels of cooperation would have to exist. Under a province wide formula, the province would have to be committed to a series of river basin planning studies to serve the entire province. Although the program would still be initiated at the provincial level, the implications of joint federal-provincial programs at this scale would be more far reaching.

Under this formula, an envelope agreement would specify a joint set of principles to be applied to the basin planning and management. The agreement would also set out a program for the implementation of the basin studies. Once again, federal participation in these programs would result from an assessment of the program's contribution to the national interests and its priority to compete for available federal resources.

In most provinces throughout Canada, this province wide program structure would prompt comprehensive river basin planning by requiring such basin plans in all sectors of the provinces. In a complimentary fashion, the provincial governments would gain federal government assistance for river basin planning studies that alternatively may not be deemed in the national interest.

The third alternative would be a composite agreement of the case-by-case and province wide agreement structures. The terms of such an agreement could vary considerably. One option proposed by the Pearse Commission would see that small scale programs be considered at a province wide federal-provincial level of agreements. Case by case systems of agreement would, therefore, be reserved for longer individual projects in water management.

Irrespective of the three alternatives outlined, Environment Canada has identified six factors that are influential in conducting all forms of comprehensive river basin planning studies. In this series of recommendations, considerable importance is given to identifying and defining a core of relevant issues to be addressed on the planning study. Using a cyclical approach in generating recommendations during the course of the study could be conducive to public participation, increased flexibility with constant reviewing, and possibly more rapid implementation. Primary data sources were deemed necessary for in-depth studies, with concentration on providing practical and implementable recommendations. This entire framework for study purposes requires considerable flexibility, but the study period should be restricted to two years for an in-depth report and one year for an investigative study. Addressing the pros and cons of joint comprehensive river basin planning involves the assessment of a full spectrum of costs and benefits at both the federal and provincial levels of government. The limitations levied by each level of government has the potential to completely undermine a valuable water resource management tool in the long term management of the resource. Successfully lobbying for certain rights or jurisdiction of particular water bodies is of little value unless a planning and/or resource management agreement continues to follow from the negotiations. In areas of joint federal-provincial cooperation, the non-binding nature of these cooperative ventures seems to be particularly susceptible to this non constructive state of affairs. Without the ongoing commitment to comprehensive river basin planning studies on the behalf of both the federal and provincial governments negotiators, non cooperation has the potential to result in the demise of an otherwise valuable tool in water resource management.

Cooperative water management programs have been concluded with greater ease where the focus of the program has been a specific water body or issue that has already been raised in the community. The political implications and commitments are of a short term nature, and the programs are generally of a response nature rather than a preventative nature. In contrast to the long term benefits to be gained from comprehensive river basin planning, these specific issue oriented agreements offer short term solutions to an immediate problem. These forms of agreement have typified the minimum level of cooperation between the federal and provincial levels of government.

Over 30 such agreements have been signed with the provinces across Canada under the Canada Water Act. Most of the agreements are cost shared on a 50/50 basis between federal and provincial levels of government.

One of the primary benefits to be gained from this form of limited cooperative agreement is the wide variety of issues that may be addressed. The subject areas of existing agreements include:

-water resource development
-water quality standards
-flow regulation
-water regulation and apportionment
-flood damage reduction
-sewage treatment technology

-water supply system reliability

-effects of urbanization

-water quality monitoring

-mercury pollution

-toxic substances in water

-project impact assessment

-project impact mitigation

-ecological inventory

-estuary planning

-shore damage surveys

Most of these issue specific agreements dealt with environmentally based problems and issues which relate to water. These agreements fall essentially under the mandate of the Canada Water Act and are, therefore, generally joint programs with Environment Canada as the lead federal agency. A small number of agreements have been concluded, which raise economic rather than environmental issues with regard to water management.

In order to accommodate the variety of issues covered under these agreements, a particularly flexible framework for negotiations has to be maintained...

> "since water affects so many fields of responsibility and endeavor. Joint responsibility, with all potential users represented, is the most desirable; and while concensus decisions are difficult and slow to reach, they are most likely to provide the best choices."

[324]

Establishing this flexible framework in federal-provincial agreements at the level of specific issue oriented agreements could enhance the potential for similar flexibility in traditionally more formal, comprehensive basin-planning and implementation agreements.

With certain modifications to the framework of the two types of agreements, many of the differences between issue specific and comprehensive river basin planning agreements could be bridged. Two alternatives have been discussed in the Pearse Commission. The first alternative essentially adopts the existing framework for issue specific oriented agreements. The proposed modifications would see either the federal government or the provincial government being able to initiate proposal. Furthermore, the flexibility of the agreement would be somewhat reduced to adapt to the availability of funding. Proposed funding procedures would be of two varieties. The first would have a set funding ceiling for each province, with funding allocated between planning or implementation programs. The second proposal would have all cooperative programs categorized according to a federal government set of priorities.

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[324] from correspondence with C.W. Lindwall, Lethbridge: Head, Soil Science Section, Research Branch, Agriculture Canada. (1986).

Cooperative federal-provincial projects deemed of high priority in the national interest would receive 50 percent financing under this procedure. Under this procedure flexibility in the scope of issue specific oriented agreements would be significantly reduced.

The second alternative to modify the existing framework being used in issue specific oriented agreements is an attempt to further reduce the differences in structure between the comprehensive river basin planning and issue specific agreements. With this modification, the duration of the program would be set, and the base of the agreement would be broadened to permit the negotiation of subsidiary agreements under the umbrella agreement. The degree of cooperation in time commitment and degree of interaction between federal and provincial departments would be significantly increased under this framework.

With a proposed term of five years, the umbrella agreement approach would have the distinct potential for a more focused and cohesive approach to water management issues. The provision for subsidiary agreements with coordinating agencies at the federal and provincial levels could only serve to consolidate this approach. This form of agreement would reduce the number of programs established in crisis situations to address a particular issue. With foresight, preventive programs could be substituted in many of the water resource management sectors.

The most serious limitation to this framework would be the refusal of a provincial government participating in the umbrella agreement.

The limitations associated with this case of non cooperation become more complex when more than one provincial government is involved. The option to operate outside of this umbrella framework would significantly reduce the effectiveness of the modification in issue specific agreements.

Working within the umbrella agreement could potentially save both provincial and federal levels of government considerable time and effort in reducing the duplication that occurs in conducting separate programs in water management. Coordinating several cooperative programs through the use of a single agreement framework could also prove to be an efficient administrative tool in monitoring federal-provincial relations.

In contrast to the decline in the number of recent river basin planning agreements, issue specific federal-provincial agreements have rallied in popularity for numerous reasons. The issue oriented agreements are flexible in framework and are receptive to provincial initiation and input into programs. These agreements also address specific issues within the river basin unit and generally provide a direct response to immediate problems or issues.

Perceived federal intrusion into water management is kept to a minimum, while federal-provincial cooperation in an area of provincial jurisdiction is enhanced. Under issue specific agreements,policy change with respect to federal-provincial cooperation is more easily achieved by gradual process. With long term agreements non-cooperation between federal and provincial levels of government has greater potential to become firmly entrenched.

British Columbia, Saskatchewan, Manitoba, Ontario and Quebec have all concluded five or more cooperative issue specific agreements. Alberta's reluctance to enter into such federal-provincial agreements is particularly apparent and opposes the general trend being set across Canada.

The structure of the issue specific agreement has also been broadened to include multiple issue specific agreements in several provinces. These multiple issues specific agreements are somewhat similar to the province-wide agreements in that they address more than one issue. Province wide agreements differ however in that they apply to a number of water bodies in the respective province(s). Province wide agreements are not limited to the federal sponsorship of Environment Canada, under the Canada Water Act. The Department of Regional Industrial Expansion (currently in reorganization) and the former Department of Regional

Economic Expansion have been active sponsors of province wide agreements.

The purpose of the province wide agreement framework is to establish a more coordinated and balanced approach to issues, hitherto dealt with in a more piecemeal fashion. Participation by the provinces in these province wide agreements is voluntary and beyond meeting the basic principles, there is considerable latitude to address each province's particular needs.

The majority of province wide water management programs in Alberta that involve several agencies at a federal and provincial level could be concluded as subsidiary agreements. These agreements would be subsidiary to an umbrella agreement between the federal and provincial governments. In contrast to this framework for province wide agreements the federal-provincial programs sponsored by Environment Canada, in Alberta, are operated independently of any umbrella agreements. The cooperative role of the Prairie Farm Rehabilitation Administration in the implementation of the Alberta Water Supplies Assistance Program (1988) provides another example of a case in which no formal federal-provincial, cooperative agreement is in place. Significant differences, therefore, do exist in the structural framework of programs offered by different federal agencies. These differences extend to include differring standards in approving proposals for cooperative federal provincial programs. Different ratios in cost benefit analyses and cost sharing formulae are used by different federal agencies to evaluate the merits of the same proposed programs. These differences have, therefore, increased the potential for competition between federal agencies in negotiating provincial participation in province wide programs.

Theoretically, the provincial government can approach more than one federal agency for assistance in water management projects. Under the existing system, the provincial government would then be able to select the terms of the agreement which would best suit the water management priorities of the province.

Although this system of federal-provincial program sponsorship does give the provincial government considerable leverage to negotiate terms of agreements, several negative impacts may result. Less comprehensive water management strategies result from this more piecemeal approach to water management. Potential exists for agencies to compromise the long term benefit to be achieved by certain programs in favour of the short term participation by the province in certain water oriented programs. The existance of the bargaining nature of the procedure in soliciting provincial participation would generally lead to less objective water policy.

The primary benefits to be gained from the greater consolidation of federal agencies and the improved consistency of priorities in implementing these programs would be a more efficient system of negotiation and increased consistency in the delivery of cooperative federal-provincial water management programs. The consolidation of policy within federal agencies involved in water management would also provide greater continuity in cooperative water management programs and facilitate greater interaction between federal and provincial agencies.

The striking differences and inconsistencies in water managment policies, directives and perspectives within and between departments at the federal and provincial levels of government, is a flaw of the current water management strategies that cannot be overestimated.

Further research into the feasibility of a non-legislating, federal-provincial Water Directorate is required. The sole mandate of such a Directorate should be to ensure that the maximum degree of consistency exists in water management priorities, legislation, intra and inter departmentally, at both the federal and provincial levels of government. Apart from the structural, perceptual and political recommendations that have been suggested in the context of federal-provincial agreements, the introduction of such a Water Directorate would appear to enhance the realization of an economically and environmentally balanced approach to the comprehensive management of Alberta water resources.

> "Excellence in water planning and management is a high priority for Alberta, and considerable technical, financial and management resources are directed to the area with a view to attaining the most effective use of water amongst widely diverse current and future needs. Clearly, the mutual goal of Alberta and the federal government is the wisest possible use of a very precious resource."

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[325] from correspondence with
Walter Solodzuk, P. Eng., Edmonton: Office of the Deputy Minister, Alberta Environment. (1986).

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Appendix I

LIST OF RESPONDENTS

Respondents to the survey on the Level of Federal-Provincial Cooperation in the Management of Alberta Water Resources are listed as follows:

Armstrong, V.C. Ph. D.
Head, Criteria Section
Health Protection Branch
Health and Welfare Canada
Ottawa.

Badour, M.
Director
External Affairs, Defense, Science,
Environment & Culture Division
Program Branch
Secretariat
Treasury Board of Canada
Ottawa.

Bergstrom, G.
Senior Officer
Alberta Forest Service
Edmonton.

Boddis, W.J.
Regional Manager (West)
Farm Income Services Branch
Crop Insurance Division
Agriculture Canada.

Burns, B.M.
Regional Director
Western Region
Atmospheric Environment Service
Environment Canada
Edmonton.

Carson, J.
Department of External Affairs
Ottawa.

Clark, J. The Rt. Hon. P.C. M.P.
Secretary of State for External Affairs
Government of Canada
Ottawa.

Cline, D.E.
Assistant Deputy Minister
Design and Implementation Division
Alberta Recreation and Parks
Edmonton

Cooke, L.J.
Assistant Deputy Minister
Resource Evaluation and Planning Division
Alberta Forestry
Edmonton.

Cronkhite, R.H.
Executive Director
Water Resources Commission
Edmonton.

Culley, E.K.
Executive Director
Water Transport Committee
Canadian Transport Commission
Ottawa.

Dixon, L.
Public Affairs Assistant
Whitesehell Nuclear Research Establishment
Atomic Energy of Canada Ltd.

Pinawa.

Dominy, C.L.
Chief, Habitat Program and Freshwater
Fish Habitat Management Branch
Fisheries and Oceans
Ottawa.

Forten, M. M.A.
Senior Economist
Ecologistics Ltd.
Waterloo.

Gibson, B.
Head, Offshore Water
Water Resources Division
Natural Resources and Economic Development
Branch
Indian and Northern Affairs Canada
Ottawa

Gooch, S.E.
Director
U.S. Transboundary Division
Department of External Affairs
Ottawa.

Gorrell, G.
Director
Agriculture Canada
Edmonton.

Harker, D.B.
Head, Drainage Reclamation Section
Agriculture Centre
Lethbridge.

Hardowick, W.
Assistant Director
Strategic Planning Branch
Economic Development
Edmonton.

Houston, M.
Evaluation Engineer
Dam Safety Branch
Alberta Environment
Edmonton.

Hubert, J.P.
Director
Economic Law and Treaty Division
Department of External Affairs
Ottawa.

Kienholz, E.
Environmental Analyst
Regional Director General
Western and Norther Region
Environment Canada
Edmonton.

Ko, C. Ph.D., P.Geol.,
Section Head
Resource Evaluation Hydrogeology Branch
Alberta Environment
Edmonton.

Kohler, F.
Engineer
Alberta Recreation and Parks
Edmonton.

Koop, P.
Research Officer
International Joint Commission
Ottawa.

Kunce, V.L.
Special Projects Officer
Alberta Public Safety Services

Edmonton.

Lawford, R.
Manager of Program
Ministry of State for Science and
Technology
Ottawa.

Lindwall, C.W.
Head, Soil Science Section
Research Branch
Agriculture Canada
Lethbridge.

Mazankowski, The Hon. P.C. M.P.
House of Commons
Ottawa.

McBean, E.
Professor
Department of Civil Engineering
University of Waterloo
Waterloo.

McTaggart-Cowan, J.D.
Director
Office of Environmental Affairs

Ministry of Energy, Mines and Resources
Ottawa.

Miller, C. Ph.D.
Research Scholar
International Institute for Applied Systems
Analysis
Schloss, Laxenburg, Austria

Northcote, F.S.
Professor
University of British Columbia
Vancouver.

Pollard, D.F.W.
Senior Policy Analyst
Canadian Forestry Service
Agriculture Canada
Ottawa.

Prach, R.
Wilflife Service
Environment Canada
Edmonton.

Pratt, D.H.
Director General

Marine Policy and Programs
Transport Canada
Ottawa.

Proctor-Twigg, M.
Federal-Provincial Relations
Environment Canada
Ottawa.

Quesnel, F.
Head, Correspondence Unit
Environment Canada
Hull.

Roberts, D.
Project Manager
Acres International Ltd.
Calgary.

Rosen, F.
Executive Assistant to the Vice President
(Law)
Canadian Transport Commission
Ottawa.

Scott, A.
Professor

Department of Economics
University of British Columbia
Vancouver.

Sheppard, A.
Information Officer
Natural Science and Engineering
Research Council of Canada
Ottawa.

Steck, W.
Director
Plant Biotechnology Institute
National Research Council of Canada
Saskatoon.

Wankel, W.J.
Head, Planning Section
Agriculture Centre
Lethbridge.

Warren, W.W.
Executive Director
Development Branch
Tourism Division
Alberta Tourism
Edmonton.

Appendix II

SUMMARY OF SURVEY

This questionnaire was designed to assess the actual and potential co-operation between the federal and provincial levels of government on issues of water management in Alberta.

1. Which issues in the management of Alberta water resources do you think will face the greatest pressure in the 1980's and 1990's? Please comment on and rank the following:

   - Human activity on water resources
   - Municipal water works and waste water treatment
   - Drinking water standards
   - Socioeconomic value of water
   - Interbasin diversions
   - Economics of water export
   - Boundary water relations
   - Public participation in water resource policy
   - Aboriginal rights
   - River basin planning
   - Groundwater issues
   - Research in water management alternatives

- Agricultural water use
- Risk management
- Water demand management
- User-pay principle in water supply
- Instream resource values
- Recreation
- Industrial water use
- Hydroelectric generation
- Other

2. In which specific sectors do you expect these issues to effect the greatest change? Please refer to issues identified in question 1.
3. Which of these issues will fall exclusively under federal or provincial jurisdiction?
4. Does potential exist for federal-provincial co-operation in the resolution of these issues?
5. Which, if any agencies, do you feel would be most capable of addressing the full range of concerns raised by these issues?
6. Would you recommend amendments in jurisdiction over certain water rights, in the resolution of these issues?
7. Do co-operative federal-provincial regional planning commissions have a role to play in the comprehensive management of Alberta water resources?

8. Would the provincial or federal governments be able to competently negotiate and implement international trading agreements in the diversion, pricing and sale of water resources, originating in Alberta?
9. Should neighboring provincial governments be included in co-operative water management agreements, as an alternative to federal-provincial programs?
10. What would be the primary set of benefits to be gained from federal-provincial co-operative programs, as opposed to interprovincial program in Alberta water management?

QUESTIONNAIRE ADMINISTRATION

Individuals selected as respondents were generally senior managers of departments predominantly involved in water resources management in the Federal Government of Canada or the Provincial Government of Alberta. Where more than one questionnaire was sent to any one government department, a single respondent was usually assigned to compile and submit a single departmental response. This procedure did limit the effectiveness of the questionnaire in capturing consistencies and inconsistencies in water resources development priorities and objectives, within departments.

QUESTIONNAIRE RESPONSE

Completed questionnaires were received from forty-five respondents. The respondents were drawn largely from the the Federal Government of Canada and the Provincial Government of Alberta. Incomplete and unreturned questionnaires were not listed as respondents.

The only tendancy identified by the exercise of ranking a list of issues provided in the questionnaire was that, issues closely linked to the mandate of the department were given preferred priority. No specific general trends were discernable from the attempted correlation of priorized issues, after being ranked by each respondent.

Responses to the questionnaire did, however, provide considerable material for the identification of significant consistencies and inconsistencies in priorities, objectives and programs, both within and between departments at the federal and provincial levels of government.

Candid responses also provided an indication of the levels of frustration experienced by senior managers in the water resources development sector in dealing with interagency and federal-provincial program structures.

Excerpts taken from these questionnaires have been used quite extensively in discussions throughout this thesis.